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September 3d.

Dr. LEIDY in the Chair.

Eleven members present.

The following papers were presented for publication :

"On the genus *Podothecus*, by Theodore Gill."

"Description of a new generic type of *Blennoids*, by Theodore Gill."

"Monograph of the *Tridigitate Uranoscopoids*, by Theodore Gill."

"Synopsis of the *Polynematoids*, by Theodore Gill."

September 10th.

Dr. LEIDY in the Chair.

Twenty-one members present.

The following papers were presented for publication :

"Rectification of the paper upon *Hemiptera* of the North Pacific Exploring Expedition, by P. R. Uhler."

"*Homoptera* of the North Pacific Exploring Expedition, under Commanders Rodgers and Ringgold, by P. R. Uhler."

"Descriptions of four new species of *Hemiptera*, collected by the North Western Boundary Survey, by P. R. Uhler."

"Nine new species of North American *Limnobiadæ*, by R. Osten Sacken."

"Contributions to the *Ophiology* of Lower California, Mexico and Central America, by E. D. Cope."

September 17th.

Vice-President BRIDGES in the Chair.

Eighteen members present.

A paper was presented for publication entitled, "List of the *Mollusca* inhabiting the neighborhood of Philadelphia, by Wm. M. Gabb."

September 24th.

Vice-President BRIDGES in the Chair.

Twenty-seven members present.

On report of the respective Committees, the following papers were ordered to be published in the Proceedings.

On the genus *PODOTHECUS*.

BY THEODORE GILL.

In the Proceedings of the Academy of Natural Sciences for April, 1861, a very characteristic type of the family of *Agonoids*, recently discovered by Dr. Kennerly, the Naturalist of the North-western Boundary Survey, has been noticed. The following full and detailed description of the species is now submitted. The analytical table of the family will exhibit the relations of the genus to the other members of that group.

[Sept.

Dorsal fins two.

I. AGONINÆ.

Body compressed and elevated towards the front.

Head continuous with back, parallelopiped and compressed like *Trigla*,

Dorsal fins separated; first remote from nape, 1. *Podothecus*.

Head separated from back by a deep nuchal depression, *Hypsagoni*

Dorsal fins separated, 2. *Hypsagonus*.

Body elongated and not elevated,

First dorsal behind nape, *Agoni*.

Breast granulated,

3. *Hippocephalus*.

First dorsal remote from nape.

Lower jaw received within upper. Dorsal fins contiguous.

Thoracic plates four, forming a square, 4. *Agonus*.

Thoracic plates numerous, 5. *Paragonus*.

Jaws subequal,

Body thick. Vomerine and palatine teeth, 6. *Agonopsis*.

? Body compressed, 7. *Leptagonus*.

Lower jaw longest. Dorsal fins contiguous, 8. *Brachyopsis*.

Dorsal fin single,

II. ANOPLAGONINÆ.

Teeth on the jaws alone, 9. *Aspidophoroides*.

Teeth on the jaws, vomer and palatines, 10. *Anoplagonus*.

Genus PODOTHECUS Gill.

Syn. *Podothecus* Gill, Proc. Academy of Natural Sciences of Phila., vol. xiii. p. 77, 1861.

Body much compressed anteriorly and with the width subequal, or imperceptibly decreasing to the caudal fin. The caudal peduncle is slender, subequal and depressed. The dorsal outline is sigmoidally incurved towards the peduncle. The breast is flattened, triangular, covered with a median and, on each side, a lateral row of moderate plates; the central plates are hexagonal. Head parallelopiped, much compressed, and with the width subequal. Profile with a very decided oblique sigmoidal curve. Superciliary and occipital crests well developed and spinigerous. Temporal crests lateral. Snout prominent, depressed, and with two spines on each side, one horizontal and the other vertical or recurved. Mouth wholly inferior, with the periphery oblong semi-oval. Lower jaw received within the upper. Teeth villiform, present only on the jaws. Angles of mouth furnished with numerous barbels. Dorsal fins separated by about three plates; the first, commencing behind the fourth pair of plates, is oblong but rather high, and sustained by about nine slender spines. The ventral fins are closely approximated and received in a longitudinal lanceolate groove. Each fin has apparently a spine and two simple rays.

PODOTHECUS PERISTETHUS Gill.

The form of this species is quite similar to that of a species of *Peristethus* or *Peristedion*. The height is somewhat greatest just behind the bases of the pectoral fins, where it equals the distance between the rostral spine and the orbit; thence it quite regularly diminishes, but with a slightly sigmoid dorsal curve, the decrease being more rapid between the ends of the first and second dorsal; behind the latter it is much depressed and wider than high; the height very slowly diminishes towards the caudal. The greatest height equals 46-100 of the head's length; that behind the first dorsal, 37-100; in front of the anal, 32-100; and behind the second dorsal, 20-100.

The width very regularly and slowly decreases towards the caudal. In front of the bases of the pectorals it equals the height, or 46-100 of the head's length; behind the first dorsal it is less than the height at the same place, 1861.]

equalling 31-100 of the length of the head ; behind the second dorsal the width is greater than the height, and equals 21-100 of the head. At the fifth plate behind the latter the height is only equal to six-tenths of the width.

The sides between the superior and inferior lateral ridges are vertical ; the superior carina is straight and oblique to nearly the end of the second dorsal, and is then horizontal ; the spines only become developed under the end of the first dorsal ; they are small, compressed and acute. The inferior carina is straight on the first five plates, thence oblique to the vertical of the anal fin, and afterwards nearly horizontal ; its spines are like those of the superior carina. The space between the ridges at their commencement equals a quarter of the head's length, (25-100) ; that at the fifth plate of the lower carina, 15-100, and that above the first anal rays, 18-100. Behind the dorsal and anal fins they form nearly right angles with the dorsal and inferior surfaces of the caudal peduncle. The dorsal surface is nearly flat or slightly concave. The width between the dorso-lateral carinæ in front of the back is subequal, and equal to a fifth of the head's length, (21-100) ; it there becomes gradually narrow, and ends behind the second dorsal in an acute point, produced by the convergence of the carinæ. The width decreases more rapidly at the first than the second dorsal. The spine of the carinæ are most developed anteriorly and are obsolete behind.

The head has a parallelopiped form, like that of a *Trigloid* ; its occipito-nasal outline is sigmoidally curved ; its inferior surface plane. Its height at the nape equals 42-100 of its length ; behind the superciliary spine, 39-100 ; thence the sigmoidal curve is very oblique, the curve being increased by the development of the superciliary crests ; the spine in which each crest terminates is moderate, compressed and recurved ; the lateral occipital carinæ are well marked, slightly divergent, and end in spines similar to the superciliary. The head is widest at the opercular bones, where it equals 47-100 of the length ; the sides are nearly vertical. The interval between the superciliary crests equals a fourth of the head's length ; that between the occipital spines, 24-100.

The eyes are elliptical and of large size ; the distance of the orbit from the end of the rostral spine equals 47-100 of the length of the head ; the long diameter of the orbit equals 26-100, and the short one 21-100 of the same.

The suborbital bones are delicately waved and pectinated beneath, and have a submarginal ridge. The great suborbital bone has at the middle of its ridge a small, compressed, curved spine, from which granulated radiating striæ diverge on every side and cover the surface ; the height of the suborbital equals 16-100 of the head's length, while its length is 29-100 of the same. On the preceding bone is another smaller spine. The preoperculum is high, and its margin sigmoidal ; its crest is above the horizon of the suborbital one, well developed, and ends in an acute spine ; beneath the crest the bone is produced into an angle. Granulated radiating striæ proceed above and beneath from the commencement of the preopercular crest. The operculum is also ridged above and covered with granulated rays.

There are on each side two rostral spines ; the first is terminal, elongated conical, straight and horizontal ; the posterior is some distance behind, smaller and curved backwards. There are also two approximated curved frontal spines on an elevated base, and with three rows of granulations proceeding forward from each.

The mouth is placed quite far back, and the lower jaw is shortest ; the front of the latter is under or slightly behind the vertical of the prefrontal spines, and at a distance from the rostral spine equal to 32-100 of the head's length ; its periphery is semioval.

The angles of the jaws are furnished with many fleshy tentacles, and there are apparently smaller ones on the branchiostegal membrane.

The abdomen has a small azygous almost oblong quadrangular plate in

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front; behind but not contiguous are two hexagonal ones, elevated in the middle and with granulated rays; still further behind, and in front of the ventral furrow, is a fourth almost plain and transverse smaller plate. On each side of the mesial row are five others; the first meets the corresponding one on the opposite side, and is interposed between the first and second median plates; the fifth is smaller, and its angle only extends to the anterior angle of the ventral furrow; granulated rays diverge from or near the posterior borders.

The first dorsal fin commences behind the fourth pair of dorsal plates; it is oblong and placed between seven pairs of plates; its fourth, fifth and sixth spines are longest, and equal four-tenths (40-100) of the head's length; its first three gradually increase, and its last three decrease; all are slender.

The second dorsal is separated from the first by three pairs of plates and is placed between six; it has seven rays, all of which are articulated; the margin is decurved backwards; the longest ray exceeds that of the first dorsal, and the shortest is less than half.

The anal fin commences at a vertical drawn midway between the two dorsals, and has eight rays, each ray corresponding to a plate; all are simple and articulated; the third and fourth are longest, and equal four-tenths (40-100) of the head's; the first two rapidly increase. The margin behind is much decurved, the last ray having only a third of the length of the longest.

The pectoral fins are well developed, and reach behind to the vertical of the last dorsal spine; the angles are rounded; each fin has fourteen simply articulated rays.

The ventral fins are closely approximated and received in a lanceolate furrow; each has a short spine and articulated rays, the external of which is longest, and exceeds three-tenths of the head's length.

The anus appears to be between the fifth pair of plates behind the pectoral fins, and at the end of the ventral furrow.

The number of rays is as follows:

D. IX. 7. A. 8. P. 14. V. I. 2.

The color in alcohol is yellowish or reddish brown, with a darker margin on each plate. The rays of the pectoral fins were apparently banded at their base.

A single specimen of this most interesting fish was obtained at Simeahmoo by Dr. Kennerly. It is unfortunately in a very poor state of preservation, the head being much injured and partly fallen to pieces, the caudal fin and part of the peduncle lost, and the ventral fins have fallen out. Most of the parts of the head and the ventral fins are, however, preserved in the same bottle, and I have been thus enabled to render a sufficiently detailed and exact description. The specimen was probably about seven or eight inches long.

Description of a new generic type of BLENNIDS.

BY THEODORE GILL.

The present species was discovered by Dr. Kennerly, the Naturalist of the North Western Boundary Survey, in the waters of Washington Territory, and will be illustrated in the forthcoming Report on the Fishes of the western coast of North America.

Genus ANOPLARCHUS Gill.

Body much elongated and compressed, with its height subequal. Scales very small and imbedded in the skin. Lateral lines and mucous pores absent or rudimentary. Head small, compressed and suboval. Snout convex. Eyes small. Mouth oblique and lateral. Teeth uniserial in each jaw, and of nearly uniform size. Palate edentulous. Branchial apertures separated by a moderate isthmus. Branchiostegal membrane with an acute emargina-
1861.]

tion below and attached to the throat. Branchiostegal rays 5—5. Dorsal fin low, entirely spinous. Anal fin unarmed. Caudal small, entire. Pectoral fins moderate. Ventral obsolete.

Type *Anoplarchus purpurescens* Gill.

This genus is most nearly related to *Muraenoides* and *Apodichthys*, but is decidedly distinct from each.

It differs from *Muraenoides* by the uniserial teeth of the jaws and the unarmed palate, the attachment of the branchiostegal membrane to the throat beneath, and the consequent restriction of the branchial apertures to the sides, and the absence of anal spines as well as of ventral fins.

The genus *Apodichthys* agrees with *Anoplarchus* in the absence of the ventral fins, and of palatine and vomerine teeth, but is readily distinguished from it by the character of the dentition and by the presence of a large calamiform spine behind the anus and separated from the anal fin, as well as by the continuity of the branchial apertures beneath.

ANOPLARCHUS PURPURESCENS Gill.

The general form resembles that of a *Muraenoides* or *Apodichthys*. The height before the dorsal fin nearly equals a ninth of the total length, (11–100), and its greatest height in front of the anus an eighth ($12\frac{1}{2}$ –100) of the same. The caudal peduncle behind the last dorsal spine is about a third of the greatest height, or a twenty-fifth (4–100) of the length.

The head, from the closed lower jaw to the opercular angle, forms about an eighth (13–100) of the total length. The snout is convex; the interval between the snout or rather symphysis of the upper jaw and the orbit forms nearly a fifth of the length of the head; the distance between the orbits nearly equals a ninth. The diameter of the orbit equals the distance between the snout and orbit.

The dorsal fin commences above or slightly in advance of the pectoral fins, and at the commencement of the second eighth of the total length. The length of most of the rays averages about a third of the head's length or a twenty-fifth of the total.

The anal fin commences immediately behind the anus; it commences at a distance from the snout equal to thirty-seven hundredths of the entire length. The average height equals a third of the length of the head.

The caudal fin is convex behind, and forms nearly a twelfth (8–100) of the total length.

The pectoral fins are normally developed, convex behind, and nearly equal in length to half of the head, (6–100).

D. LVI. A. 41. C. 2, 7, 6, 2. P. 1, 11.

The color of the species is dark purple. An oblique light purple band crosses the cheek from the eye and is margined by a lighter line on each side, which separates it before from the dark narrower band behind the supra-maxillary bone, and another dark one behind which merges into the light purple color of the rest of the head. The pectoral fin has a black spot at the middle of its base. The caudal fin has several transverse light brown lines, and a well defined one at its base; near the root of the upper and of the lower rays respectively, there is also a blackish dot, encircled by light brown.

Total length, (3 8-10,).....	100
Body—Height before dorsal.....	11
“ before anus.....	$12\frac{1}{2}$
“ behind last dorsal spine.....	4
Width at pectorals.....	6
Head—Greatest length.....	13
Interval between snout and orbit.....	$2\frac{1}{2}$
Width between orbits.....	$1\frac{1}{2}$

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Diameter of eye.....	2½
Dorsal—Distance from snout.....	13
Length of first spine.....	2½
“ second spine.....	4
“ spine over anus.....	4
Anal—Distance from snout.....	37
Height at third ray.....	4½
“ at middle.....	4½
Caudal—Length.....	8
Pectoral—Length.....	6

Monograph of the Tridigitate URANOSCOPOIDS.

BY THEODORE GILL.

In the “Synopsis of the Uranoscopoids” recently published in the Proceedings of the Academy of Natural Sciences, the discovery of two new species of the genus *Dactyloscopus* was noticed, and a promise was made to describe them at another time. The present memoir is accordingly devoted to the description of the three species of that genus now known and of an additional species representing a fourth very distinct group of the same family.

The discovery of the last mentioned type has necessitated a revision of the characters formerly given to the subfamilies of the Uranoscopoids, the form of the head presenting quite a decided difference. All of the species formerly known were distinguished by the cuboid form of the head, the superior surface of which was nearly flat; the eyes were also entirely superior and next to the sides, and the cleft of the mouth was almost vertical. Such were the characters common to all the species then known. But when engaged on the present monograph, two fishes were found which were readily ascertained to be most nearly allied to the *Dactyloscopi*, but which were distinguished from them by the remarkable shape of the head. The bones are so modified that instead of producing the normal cuboid form, they cause an elongated conical one, the height and width gradually decreasing toward the snout. The interorbital area is also very slight on account of the excessive narrowness of the frontal bones. Yet, notwithstanding such remarkable differences of form, none can remain doubtful concerning the affinity of the species to the *Dactyloscopi*. The general form of the body, the squamation, the character of the lateral line, the fringed opercula and lips, the membranous extension of the suboperculum and interoperculum, the character of the fins and all other essential characters are reproduced in the two forms. The arguments that were formerly adduced in favor of the pertinence of the *Dactyloscopi* to the same family as the *Leptoscopi* are equally applicable to the newly discovered form. The relative position of the dorsal and anal fins is even similar to that of the *Leptoscopi* and different from that characteristic of the *Dactyloscopi*. Three peculiar modifications of the elongated Uranoscopoid form are now known, and the propriety of referring them to a family distinct from the comparatively short Uranoscopoids, with more or less mailed heads, is correspondingly increased. But, for the present, all are still retained under the same family.

The following diagnoses of the subfamilies and their genera are given so as to distinguish them among the other groups.

Subfamily DACTYLOSCOPINÆ Gill.

Dactyloscopinæ Gill, Proceedings of the Academy of Natural Sciences of Philadelphia, 1859, p. 133.

“ Gill, op. cit., 1861, p. 116.

The body is moderately elongated.

1861.]

The scales are moderate or rather small, cycloid, with subcentral or slightly eccentric nuclei, and with concentric striae. The lateral line runs for a short distance anteriorly on the sides of the back, is then much deflected, and then runs along the middle of the side to the caudal fin and is again deflected.

The head is cuboid and nearly plane above, and covered with the smooth and naked skin above as well as on the sides. The operculum is fringed behind; the preoperculum unarmed. The suboperculum and interoperculum have membranous extended borders.

The mouth is very oblique and nearly vertical. The lower jaw closes in front of the upper, and its periphery is semioval. The membranous fold between the limbs of the lower jaw is well developed, and conceals the front of the branchiostegal membrane.

The dorsal fin commences near the nape, and is continued nearly to the caudal fin; its rays in front are simple; the others are articulated.

The anal fin commences under the anterior portion of the anal fin, and is also much elongated and continued nearly to the caudal. The ventral fins are approximated, and each is composed of three simply articulated rays.

The relation of this subfamily to the Leptoscopinae has been previously exposed. The difference consists of the presence in the *Dactyloscopi* of only three articulated rays to the ventral fins instead of one spinous and five branched as in the Leptoscopinae. The dorsal of the latter is also as short or shorter than the anal and commences some distance behind the nape; in *Dactyloscopus* the dorsal fin commences immediately behind the nape, and is longer than the anal. The *Dactyloscopinae* are confined to the tropical American seas, while the *Leptoscopinae* are represented in the seas around the islands of Australia and New Zealand.

Genus DACTYLOSCOPUS Gill.

Dactyloscopus Gill Proceedings of the Academy of Natural Sciences of Philadelphia, 1859, p. 132.

" Gill, op. cit., 1861, p. 117.

The body is moderately elongated, its greatest height equalling about a sixth or seventh of the extreme length.

Head cuboid, oblong and nearly flat above. Eyes small and subcircular, separated by a considerable space, the frontal bones being of moderate width.

Mouth nearly vertical. Lower jaw not dilated beneath or emarginated in front, and without barbels. Intralabial filament obsolete.

Teeth villiform and only present on the jaws.

Dorsal fin with its origin near the nape, and with its first ten or twelve rays simple, and the rest articulated. Anal fin commencing under the anterior part of the dorsal.

Type. *Dactyloscopus tridigitatus* Gill.

DACTYLOSCOPUS TRIDIGITATUS Gill.

Dactyloscopus tridigitatus Gill, Proceedings Academy of Natural Sciences of Philadelphia, April, 1859, p. 132.

The greatest height is contained 14-100 times in the total length. The head from the closed lower jaw to the end of the bony operculum forms 19-100 of the length; its elevation above the inferior preopercular margin equals 11-19, and the height at the articulation of the lower jaw 9-19 of its length. Its greatest width equals 10-19 and that behind the eyes 7-19 of the same. The dorsal fin commences at the 18-100ths of distance from the snout. The caudal fin forms an eighth of the total length. The pectorals equal 16-100 of the same. The anterior part of the lateral line runs through eleven scales, is then deflected and runs very obliquely on four scales, and is thence continued along the fifth row from the back through thirty.

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D. 12, 28. A. 2, 32. C. I. 1, 8, 1, I. P. 13. V. 3.

The color appears originally to have been nearly uniform and whitish blue or almost white on the trunk; when the scales are lost the apparent color is grayish, marbled or spotted with white. The head is whitish or grayish above, variegated with coarse meandering darker lines, which partly also extend on the suborbital region and cheeks. The preoperculum, and other opercular bones are mostly immaculate. The fins are also immaculate.

The body is slender and very gradually and with much regularity declines towards the caudal fin; it is also much compressed, especially posteriorly. The height is greatest at the front of the dorsal fin, and is there nearly equal to a seventh (14-100) of the total length. The height behind the last dorsal ray exceeds little more than a fourth of the greatest, and only equals a twenty-fifth part (4-100) of the length. The thickness at the bases of the pectoral fins is contained twelve times (8-100) in the length.

The head is plane above and angulated at the sides of its superior surface. From the tip of the closed lower jaw to the margin of the bony operculum it constitutes nearly a fifth (19-100) of the extreme length. Its height between the crown and the inferior margin of the preoperculum is much less than two-thirds of its length (11-100 of the total). The height at the articulation of lower jaw nearly equals a half of the length (9-100 of the total). The thickness of the head is greatest close behind the preoperculum, and exceeds a half of the length, or one-tenth (10-100) of the total; it thence gradually diminishes to the obtuse snout; behind the eyes, it equals seven-tenths of the greatest width, or 7-100 of the total length.

The eyes are moderate, circular and entirely superior. The diameter of the orbit is contained more than six times in the head's length, and equals 3-100 of the total length. The distance between the eyes equals two-thirds of the diameter, and the distance from the symphysis of the intermaxillaries a diameter.

The posterior border of the basal ridge of the preoperculum is nearly vertical, and descends toward the angle, which is rounded. The width of the preoperculum is greatest at the angle between the ridge and the free margin; it is there a half greater than the diameter of the eye ($4\frac{1}{2}$ -100 of the total length). Near the free margin of the preoperculum, there is a band of paired pores.

The dentary on its posterior part has three broad transverse channels. The opercular fringe is composed of about fifteen distinct and free filaments.

The dorsal fin commences at 18-100 of the length from the upper jaw, and has forty or forty-one rays; about twelve of these are simple and inarticulated, while the others are articulated, and divided on each side of the mesial line to the base, but so connected as to appear like simply articulated rays, especially from a lateral view.

The anal fin commences under the sixth or seventh ray of the dorsal; it has about thirty-four rays; the first two are simple and inarticulated; the rest are divided to their bases and articulated.

The caudal fin is narrow, rather long, truncated behind, and furnished with eight branched rays, two articulated and two simple ones. The fin forms nearly an eighth (12-100) of the total length.

The pectoral fins are acutely angulated; the superior rays rapidly increase towards the fifth, which is longest, and equals the sixth (16-100) of the total length; the rays beneath rapidly decrease, and the margin of the fin converges toward the base, which extends very obliquely forward.

The ventral fins are each composed of three articulated and stout rays, but which are attenuated at the extremities. The external ray is shortest; the median is little longer than the internal, and equals an eighth (12-100) of the total length.

The scales are of moderate size and regularly imbricated. The lateral line 1861.]

runs along the second row of scales from the dorsal fin, through eleven scales, is moderately deflected on the eleventh, runs obliquely through four scales, and is again continued horizontally on the fifth row from the top through about thirty or thirty-one scales.

Total length, 3 inches,.....	100
Greatest height.....	14
Least height (behind last dorsal ray).....	4
Thickness at pectorals.....	8
Head—Length.....	19
Height over preoperculum.....	11
Thickness at preoperculum.....	10
“ behind eyes..	7
Height at eyes.....	9
Interorbital area.....	2
Eye—Diameter.....	3
Distance from snout.....	3
Dorsal—Distance from snout.....	18
Caudal—Length.....	12
Pectoral—Length.....	16
Ventral—Length.....	12

The *Dactyloscopus tridigitatus* is readily distinguished among its congeners by its color and the number of scales through which the anterior elevated portion of the lateral line runs. The body is also comparatively slender, and the head short and narrow. The dorsal likewise commences at a greater distance from the head than in its nearest relation.

This species appears to be quite extensively distributed through the Caribbean sea. Three specimens, from which the species was originally described, were discovered at the island of Barbados. Another specimen is preserved in the Smithsonian Institution that was obtained at Garden Key, near the coast of Florida. Mr. Poey has also detected an individual of the same species on the Cuban coast, and has presented it to the Smithsonian Institution.

DACTYLOSCOPUS POEYI Gill.

The greatest height is contained 16–100 times in the total length. The head forms a fifth of the same; its height over the inferior preopercular border equals a half (11–20) and that at the eyes 9–20 of the length; its greatest width exceeds a half of its length, and that behind the eyes 8–20. The dorsal fin is distant a sixth (16–100) of its length from the snout. The anterior part of the lateral line runs through thirteen scales, is then deflected through three and afterwards runs along the fifth row from the back through about thirty-two.

D. 11, 31. A. 2, 32. C. 1, I. 8, I. 1.

The color is reddish brown, dotted with darker above the lateral line. The head is also blotched and dotted with darker, through which the ground color is exhibited in streaks and blotches, especially around the eyes. The operculum is variegated; the other opercular bones nearly immaculate.

The body has the same form as the *Dactyloscopus tridigitatus*, but is more robust; the greatest height exceeds a sixth of the total length, (16–100); the height at the caudal peduncle, behind the last dorsal ray, equals a fourth of the greatest length. The thickness at the breast equals two-thirds of the greatest height, (11–100 of the length).

The head is plane above and obtusely angulated at the sides of the plane. Its length constitutes a fifth (20–100) of the total. Its height between the crown and the inferior margin of the preoperculum exceeds half of its length, or 11–100 of the total. That at the articulation of the lower jaw does not equal half of the length, (9–100 of the total). The thickness of the head be-

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hind the preoperculum exceeds a half of its length, or a ninth (11-100) of the total ; that behind the eyes equals eight-elevenths of the greatest or 8-100 of the total length.

The eyes are similar to those of *Dactyloscopus tridigitatus*. The diameter of the orbit is contained nearly seven times (3-20) in the head's length, and equals 3-100 of the total. The distance between the eyes equals two-thirds of a diameter, and that from the snout a whole diameter.

The preoperculum has the same form and proportions as *Dactyloscopus tridigitatus*. The pores are very indistinct or obsolete.

The opercular fringe is formed by about eighteen filaments, the lowest of which are scarcely extended beyond the margin.

The commencement of the dorsal fin is distant from the snout a sixth (16-100) of the entire length. It has about forty-two rays, of which the first eleven appear to be simple and inarticulated, and the rest are divided as the typical species.

The anal fin commences nearly under the sixth ray of the dorsal fin ; it has about thirty-four rays, the first two of which are simple and inarticulated. The rest are branched.

The caudal fin has ten articulated rays, of which eight are branched and two simple ones, one above and another below.

The scales are of moderate size and regularly imbricated. Each one is short or little oblong, with the nucleus little eccentric and with well defined concentric striæ on the whole surface ; there are no radiating grooves or ridges. The lateral line runs above through thirteen scales, is then deflected and continued very obliquely on three, and again runs through the fifth row from the back along about thirty-two scales to the caudal fin.

Total length, (2·6,).....	100
Greatest height.....	16
Height behind last dorsal ray.....	4
Thickness at pectorals.....	11
Head—Length.....	20
Height at preoperculum.....	11
Thickness at preoperculum.....	11
“ behind eyes.....	8
Height at eyes.....	9
Interorbital area.....	2
Eyes—Diameter.....	3
Distance from snout.....	3
Dorsal—Distance from snout.....	16
Caudal—Length, (assumed).....	12

This species is closely related to the *Dactyloscopus tridigitatus*, but is readily known by its color and the number of scales through which the anterior part of the lateral line runs, as well as by its stouter and more robust body, its longer and wider head and the less distance between the snout and the commencement of the dorsal fin. The caudal fin is mostly destroyed, and the above table of measurements has been calculated for the total length, on the supposition that the caudal fin, as in the type of the genus, bears the proportion to the entire length of twelve to a hundred. The pectoral and ventral fins have been also mutilated.

A single specimen of this species was obtained by my learned friend, the Professor of Zoology and Comparative Anatomy in the Royal University of Havana. In testimony of my appreciation of his labors to elucidate the natural history of Cuba, I have dedicated the species to him. The specimen has been presented to the Smithsonian Institution.

DACTYLOSCOPUS PECTORALIS Gill.

The greatest height is less than a seventh (15-100) of the total length. The 1861.]

head forms more than a fifth (21-100) of the same ; its greatest height above the preoperculum equals 12-21, and that at the articulation of the lower jaw 10-21 of its length. Its greatest width equals two-thirds (14-21), and that behind the eyes more than one-third (8-21) of its length. The dorsal fin commences at the eighteen-hundredths of the length. The caudal fin forms 14-100 of the total length ; the pectoral 22-100. The anterior part of the lateral line runs through thirteen scales, is deflected on three, and then continued along the fifth row from the back through twenty-four.

D. 12, 22. A. 2, 26. C. 1, 1, 4, 4, 1, 1. P. 12. V. 3.

The color is a light brownish yellow, with dark spots on the back, arranged in lines forming the outlines of about six quadrangular areas, from the angles of which irregular lines proceed downwards and converge towards those departing from the angles of the adjoining areas. Such is the pattern of coloration, but it is subject to considerable irregularity. More scattered and irregular spots or dots are often present beneath the lateral line. The head is rather lighter and sometimes suffused with pink above. A transverse band or blotch divided in front is present between the orbits behind. Four rays also diverge in pairs from each orbit ; one from the front ; a bifurcated one from the antero-inferior angle ; and two from the posterior border. On the crown are two dark spots. There is a transverse sinuated nuchal line. Behind and below the orbit is a whitish area, with a dark spot before and behind. The upper angle of the operculum is whitish, bounded in front by a dark line or spot.

The height behind the nape is less than a seventh of the total length (15-100). That at the caudal peduncle behind the last dorsal ray equals a third of the greatest, (5-100 of the length). The thickness at the bases of the pectorals equals 12-100 of the length.

The head is not so plane as in the Caribbean species, and the sides less angulated. The length from the tip of the lower jaw to the end of the bony operculum constitutes more than a fifth (21-100) of the total. Its height between the crown and the inferior margin of the preoperculum exceeds twelve-hundredths (12-100) of the total length. The height at the articulation of the lower jaw equals a tenth (10-100) of the same. The width of the head behind the preoperculum equals a seventh (14-100) of the total length, while the width behind the eyes, is eight-fourteenths of the greatest, or 8-100 of the length.

The eyes are small, the diameter equalling a tenth (7-21) of the head's length ; they are separated from each other by a space equalling a diameter, and their distance from the upper jaw or snout is equal to a seventh (3-21) of the head's length.

The preoperculum has nearly the same form as that of *Dactyloscopus tridigitatus*, but it is rather broader at the angle ; the pores are well developed.

The opercular fringe is formed by about eleven or twelve free filaments.

The dorsal fin commences at 18-100 of the length from the snout, and has about thirty-four rays, the first twelve of which are apparently simple and inarticulated.

The anal fin commences nearly under the sixth or seventh dorsal ray, and has about twenty-eight rays, the first two of which are simple.

The caudal fin forms a seventh (14-100) of the total length. It has eight branched rays, two simply articulated ones, and two simple, one above and one below.

The pectoral fins have twelve rays, the fifth of which is longest, but the fourth and sixth are also much longer than the adjoining ones. The longest exceeds in length a fifth (22-100) of the entire length.

The ventral fins are similar in structure to those of its allies. The internal ray is as long or longer than the median, and equals an eighth (12-100) of the total length.

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Total length, 1.7½.....	100
Greatest height.....	15
Height behind last dorsal ray.....	5
Thickness at pectorals.....	12
Head—Length.....	21
Height over preoperculum.....	12
Thickness at preoperculum.....	14
“ behind eyes.....	8
Height at articulation of lower jaw.....	10
Interorbital area.....	2
Eye—Diameter.....	2
Distance from snout.....	3
Dorsal—Distance from snout (symphysis).....	18
Caudal—Length.....	14
Pectoral—Length.....	22
Ventral—Length.....	12

This species is very distinct from the two West Indian species of the genus. It is readily distinguished by its different proportions. The head is longer, wider and higher than in its congeners; the caudal fin and especially the pectorals are larger, the number of dorsal and anal rays less, and the number of scales through which the posterior or median part of the lateral line runs is different. It is also readily recognizable by its different colors. The size to which it attains is much less, the average length being little more than an inch and a half.

Three specimens were obtained by Mr. John Xantus, at Cape St. Lucas, and have been sent by that indefatigable naturalist to the Museum of the Smithsonian Institution.

Subfamily MYXODAGNINÆ Gill.

The body is considerably elongated, the length being about ten times as great as the height.

The scales are moderate or rather small, cycloid, and with subcentral or slightly eccentric nuclei and concentric striæ. The lateral line at first is on the side of the back, but is soon deflected and again runs in a straight line along the middle of the sides towards the caudal fin; then its end is again deflected.

The head is oblong or rather elongated, conical in profile, and more or less transversely arched above. The skin is smooth. The operculum is fringed behind. The preoperculum unarmed. The suboperculum and interoperculum have moderate or rudimentary extended membranous borders.

The mouth is moderately oblique and never subvertical. The lower jaw is prominent.

The membranous fold between the limb of the lower jaw is small or rudimentary and only developed anteriorly.

The dorsal fin is much elongated, but commences far from the nape, and is as short as, or shorter than, the anal. It arises behind the vertical of the anus.

The anal fin is very elongated.

The ventral fins are approximated, and each has three simply articulated rays.

This group is very closely related to the Dactyloscopinæ, but differs so much in the form of the head that its affinities at first might well be overlooked.

Genus MYXODAGNUS Gill.

The body is quite slender, the greatest height being contained about ten times in the length.

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Head rather elongated and acutely conical, about twice as long as high. Eyes large and elliptical, and very closely approximated. The frontal bones are extremely narrow.

Mouth oblique. Lower jaw projecting much beyond the upper and furnished with a short compressed and wide flap or barbel in front of the symphysis.

Villiform teeth present only on the jaws.

Dorsal fin behind the vertical of the anus, and furnished with simple and articulated rays. Anal fin as long as or longer than the dorsal.

MYXODAGNUS OPERCULARIS Gill.

The body is highest in front of the dorsal fin, and nearly equals at that place a tenth of the total length; thence it regularly declines towards the caudal fin, and, behind the dorsal, is less than a third of the height in front. The width at the bases of the pectorals is equal to two-thirds of the greatest height, or 6-100 of the length.

The head is acutely conical and elongated; from the tip of the lower jaw to the end of the bony operculum it forms a sixth (17-100) of the entire length; from the front of the upper jaw to the same place, 16-100. Its greatest height at the vertical of the preopercular margin exceeds a half (9-17) of its length; that behind the eyes more than a third, (6-17). The profile is nearly straight, but very slightly concave in front of the eyes. The crown is transversely arched and smooth. The width at the preoperculum equals 7-17 of its length; the width behind the eyes a quarter of the same. The frontal bones between the eyes are exceedingly narrow, so that the orbits appear to be separated by little more than a mere septum.

The eyes are longitudinally elliptical and of large size. The long diameter of the orbit nearly equals the thickness behind, or quarter of the head's length. The distance between the snout or symphysis of the upper jaw and the orbit equals three-fourths of a diameter.

The posterior margin of the preoperculum is much less than the inferior and nearly vertical; the latter is oblique. The breadth is greatest at the angle. The pores are obsolete. The postorbital or temporal ridge is nearly as long as the diameter of the orbit.

The opercular fringe is composed of six or seven short filaments. The membranous extensions of the subopercular and interopercular bones are moderate and rather stiff.

The dorsal commences behind the vertical of the anus and the end of the first fourth of the total length, and behind the vertical of the posterior margin of the seventh scale of the lateral line. Its height at the middle equals a half of the greatest height of the body; there are thirty-six rays, none of which appear to be divided, and the articulation is itself almost obsolete.

The anal fin commences in front of the dorsal and before the end of the first fourth (23-100) of the length; about two rays are in advance of the dorsal. The height at the middle equals seven-tenths of the greatest height of the body. There are thirty eight rays, the first two of which appear to be simple, and the rest are simply articulated.

The caudal fin forms an eighth (12-100) of the total length. It has eight articulated rays forked at its terminal half, two simply articulated rays and two short simple ones.

The pectoral fins are angulated behind by the extension of the sixth as well as of the fifth and seventh rays. The superior four rapidly increase towards the fifth. The margin of the fin beneath is much curved forwards, the rays rapidly decreasing. The longest ray exceeds a fifth of the total.

The ventral fins have each three simply articulated and rather stout rays; the median is longest and equals a third of the pectoral's, or 7-100 of the total length.

The scales are of moderate size, finely striated concentrically, and arranged
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in eleven rows on each side. The lateral line runs through twelve on the sides of the back, is then deflected through three, and thence runs along the fifth row from the back through thirty-six.

D. 36. A. 2, 36. C. I. 1, 8, 1, I.

The color is a light yellowish brown, rendered darker on the back by congregations of dark dots on the scales. There is a margaritaceous spot behind and beneath the eye, and the operculum is also colored in the same manner.

Total length, 2·3.....	100
Greatest height.....	9½
Height behind dorsal fin.....	3
Thickness of pectorals.....	6
Head—Length from lower jaw to bony operculum.....	17
“ from upper jaw.....	16
Height at preoperculum.....	9
“ behind eyes.....	6
Thickness at preoperculum.....	7
“ behind eyes.....	4
Eye—Diameter.....	4
Distance from snout.....	3
Dorsal—Distance from snout.....	25
Anal—Distance from snout.....	23
Caudal—Length.....	12
Pectoral—Length.....	21
Ventral—Length.....	7

This species is a native of the waters of Lower California. Several specimens were obtained by Mr. John Xantus at Cape St. Lucas, and are now preserved in the Museum of the Smithsonian Institution.

Synopsis of the POLYNEMATOIDS.

BY THEODORE GILL.

The family of Polynematoids has been recently established as now accepted, and its limits very accurately defined by Dr. Günther in his catalogue of the Acanthopterygian fishes of the British Museum. The principal characteristics by which its representatives can be at once recognized are the free filaments on each side of the breast below the pectorals, the protuberant snout, distant dorsal fins, and the abdominal position of the ventrals. The family characters in detail are the following:

Family POLYNEMATOIDÆ Bleeker.

Polynematoidæ *Günther*, Catalogue of the Acanthopterygian Fishes, &c., vol. ii.

Polynemidæ partim *Richardson*, &c.

Percidæ pt. *Cuvier*, &c.

Body oblong or moderately elongated and highest over the anus, which is subcentral. Caudal peduncle oblong and robust. Scales regularly imbricated, generally ctenoid and mucated, and of moderate or rather small size, extending on the head and fins.

Lateral line continuous and nearly straight. Continued on the caudal fin. Head oblong, moderate or rather small, compressed and slowly decreasing in size towards the snout, which is high and protuberant. Eyes moderate or large, and wholly or mostly anterior. Nostrils double. Suborbital bones very low; none articulated with the preoperculum. Opercular bones normally developed. Suboperculum oblique and forming the posterior angle. Mouth moderately oblique, and continued under the eyes behind. Teeth acute, always present on the jaws, and generally on the palate. Branchiostegal

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membrane deeply and acutely emarginated beneath, and with a very narrow free border behind. Branchiostegal rays seven on each side.

Dorsal fins two and entirely separated. The first with from five to nine spines; the second quite remote from the first and short, with most of its rays branched. Anal fin short or oblong. Caudal fin emarginated or forked. Pectoral fins inserted low on the humeral cincture, and normally developed; its angles are obtuse. Beneath and in front are many (3—14) free articulated filaments. Ventral fins thoracic and under the spinous dorsal; each has a spine and five branched rays, the first or second of which is longest.

The muciferous excavations and channels of the bones of the head are well developed.

The vertebral column is composed of about twenty-four or five vertebræ, nine or ten of which bear ribs.

The stomach is cæcal; the pyloric cæca are present generally in moderate number, rarely numerous.

The air bladder is very variable in form, structure and development, and is sometimes absent. Its modifications do not appear to be even coincident with generic characters.

The nearest allies of this family appear to be the Sciænoids. This affinity is indicated by the presence in both of the muciferous excavations of the skull, the extent of the squamation and the obliquity of the rows of scales, the weakness of the dorsal and anal spines, &c. The number of vertebræ and the character of the intestinal canal are also nearly similar to those of the Sciænoids. The most distinctive characters of the present family have been indicated in the preliminary remarks.

On the other hand, they resemble the Mugiloids by the interval between the dorsal fins, and even in some degrees by the form, squamation and position of the ventral fins.

The following analytical table indicates the most distinctive features of each genus.

Anal twice as long as second dorsal.	Preoperculum entire,	POLYNEMI.
Palatine and pterygoid teeth.	No vomerine teeth.	Pec-
toral filaments 5,		1. Polynemus.
Second dorsal and anal fins equal.	Preoperculum serrated,	TRICHIDIONTES.
Palatine, pterygoid and	{ Pectoral filaments 3—8,	2. Trichidion.
vomerine teeth.		3. Polistonemus.
Palatine teeth. No vomer-		
ine or pterygoid teeth.	{ Pectoral filaments 10—11,	4. Galeoides.

Group *POLYNEMI* Gill.

Pinna analis pinnâ dorsali longior, antice infra pinnam dorsalem. Preoperculum inerme.

Anal fin longer than the second, and with its anterior portion beneath it. Preoperculum entire and not dentated.

POLYNEMUS Gronovius.

Polynemus Gronovius, Museum Ichthyologicum, p. 31, 1754.

Pentanemus Artedi, in Seba's Locupletissimi Rerum Naturalium Thesauri accurata descriptio, &c., tom. iii. p. 74, 1758.

Pentanemus Günther, Catalogue of the Acanthopterygian Fishes, vol. ii. p. 330, 1860—61.

Pinna analis pinnâ dorsali duplo longior. Dentes velutini ossibus maxillaribus superiori inferiorique, palatinis et pterygoideis.

Body oblong and moderately compressed, covered with moderate scales.

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Head oblong, with the snout projecting. Preoperculum unarmed. First dorsal fin above the pectorals, and sustained by eight spines; second dorsal oblong. Anal fin elongated; its anterior half is mostly opposite to the dorsal fin. Pectoral filaments generally five and extremely elongated.

Type. *Polynemus quinquarius*.

The genus *Polynemus* as now restricted is quite different from that called by the same name by recent naturalists, its type not having been known to Cuvier and Valenciennes, and disagreeing in its generic characters with all the species referred by them to that genus. The present has the same limits as *Pentanemus* of Günther, but that name cannot be preserved.

The name of *Polynemus* was first introduced into Science by Gronovius, and must be retained for this genus, while almost all of the species which have been described by Cuvier and Valenciennes and subsequent authors as *Polynemi*, should be placed in a genus called *Trichidion*. Gronovius has, with his usual ability and accuracy, characterized the genus in his "Museum Ichthyologicum," and has referred to *Pentanemus*, a manuscript name of Artedi, which he has refused to adopt on account of its too exclusive character, and because it does not apply to a species figured by Edwards which was supposed to belong to the same genus.* Gronovius has only described one species, which is the same as that known by Artedi, whose description and figure were published four years afterwards in the great Thesaurus of Seba. Gronovius indeed alludes, at the end of his description of that species, to the fish of Edwards, but the genus was established more especially for the species described, and was intended to supersede Artedi's unpublished name. His must be, therefore, evidently retained for the species described, while Artedi's must be considered as a synonyme. In no case could that of *Polynemus* be retained for the majority of the Polynematoids, for Klein had previously formed a genus to which he had given the name of *Trichidion*, which included such species.

POLYNEMUS QUINQUARIUS Linn.

Polynemus Gronovius.

Pentanemus Artedi.

Polynemus quinquarius Linn., Systema Naturæ, vol. i. p. 521.

Polynemus Artedii Bennett, Proc. of the Committee of the Zoological Society of London, vol. i. p. 146.

Polynemus macronemus Pel. Bijdragen tot de dierkunde, vol. i. pp. 9, 10, pl. vi. *Habitat*.—West Indian seas and the western coast of Africa.

Group TRICHIDIONTES Gill.

Pinna dorsalis analisque subæquales, oppositæ. Preoperculum armatum.

Dorsal and anal fins nearly equal and opposite to each other. Preoperculum armed.

* Ob nimis strictam Cl. Artedii denominationem, nomen *Pentanemi* displicet, quum sub eodem Genere militat *Paradisæa piscis Edwardi*, cui septem Appendices ad Pinna Pectoris, qui hinc inscribendus esset *Heptanemus*; verum ad evitandas plures confusiones, nomine parum generaliori *Polynemi* nimirum, insignire non dubitavi. Nomen autem compositum est ex *πολυς* and *νῆμα* filum, utpote a parte inferiore Pinnarum Pectoralium ossicula utrinque continet, quæ in aliis piscibus insolita sunt.

† *Polynemus macrophthalmus Bleeker*, Acta Societatis Indo-Nederlandica, vol. v. Zeevende Bijdr. ichth. Sumatr. p. 10.

Habitat.—Sumatra.

The description is unknown to me, not having yet seen the fifth volume of the Acta.

TRICHIDION (Klein.)

Trichidion *Klein*, *Historiæ Piscium Naturalis promovendæ missus quintus*, p. 28, 1749.

Polynemus sp. *Gronovius*, *Linn.*, auct.

Polydactylus *Lacépède*, *Histoire Naturelle*.

Tringa sp. *Forster*.

Polynemus *Günther*, *Catalogue of the Acanthopterygian Fishes, &c.*, vol. ii. p. 319.

Trichidion *Gill*, *Catalogue of the Fishes of the Eastern Coast of North America*, p. 40.

Dentes velutini maxillis duobus et ossibus vomerino, palatinis et pterygoideis. Filamenta pectoralia 3—8.

Body oblong, covered by scales of moderate size. Head oblong, and with a protuberant snout. Preoperculum serrated. Both jaws, the vomer, and the palatine and pterygoid bones armed with villiform teeth. First dorsal fin placed above the ventral fins, and sustained by seven or eight spines. Second dorsal and anal fins oblong, opposite and nearly equal. Pectoral filaments in moderate number, varying from three to eight in the known species.

Type. *Trichidion Plumieri*.

Trichidion includes all the species described by Cuvier and Valenciennes under the name of *Polynemus*, with the exceptions of their *Polynemus dekadactylus* and *P. enneadactylus*. Those fishes belong apparently to the same species, and have been united by Dr. Günther under the name of *Galeoides polydactylus*. The following is a list of the species described.

Species with eight pectoral filaments.

TRICHIDION OCTONEMUS.

Polynemus octonemus *Girard*, *Proceedings of the Academy of Natural Sciences of Phila.*, 1858, p. 167.

Habitat.—Texas.

TRICHIDION OCTOFILIS.

Habitat.—Atlantic coast of North America.

Species with seven pectoral filaments.

TRICHIDION PARADISEUS.

Polynemus paradiseus *Linn.*, *Systema Naturæ*, vol. i. p. 401.

Polynemus *Gronovius*, *Zoophylacium*? sp. 398.

Polynemus risua *Hamilton*, (*Buchanan*), account of the Fishes of the Ganges? p. 228.

Polynemus toposui *Hamilton*, (*Buchanan*), op. cit., p. 232?

Polynemus aureus *Hamilton*, (*Buchanan*), op. cit., p. 232.

Polynemus longifilis *Cuv. et Val.*, *Hist. Nat. des poissons*, tom. iii. p. 365, tom. vii. p. 512.

Habitat.—East Indian seas and the mouths of rivers.

TRICHIDION DUBIUS.

Polynemus dubius *Bleeker*, *Enumeratio Piscium hucusque in Archipelago Indico observatorum*, p. 39.

Habitat.—Sumatra and Borneo.

TRICHIDION MACRONEMUS.

Polynemus macronema *Bleeker*, *Natuurkundig Tijdschrift voor Nederlandsch Indie*, iii. p. 419, 1852.

Polynemus Borneënsis *Bleeker*, *Enumeratio Piscium hucusque in Archipelago Indico observatorum, &c.*, p. 39.

Habitat.—Coast and rivers of Borneo.

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TRICHIDION OLIGODON.

Polynemus oligodon *Günther*, Catalogue of the Acanthopterygian Fishes, &c., vol. ii. p. 322.

Habitat.—Atlantic coast of tropical America.

TRICHIDION PLUMIERI.

Polynemus paradiseus *Bloch*, Naturgeschichte der Ausländischen Fische, tom. xii. p. 28, tab. 402.

Polydactylus Plumieri *Lacépède*, Hist. Nat. des Poissons, tom. v. pl. xiv. fig. 3.

Polynemus Americanus *Cuv. et Val.*, Hist. Nat. des Poissons, tom. iii. p. 393.

Trichidion Plumieri *Gill*, Catalogue of the Fishes of the Eastern Coast of North America, p. 40.

Habitat.—Caribbean Sea and perhaps the eastern coast of North America.

TRICHIDION MULTIRADIATUS.

Polynemus multiradiatus *Günther*, Catalogue of the Acanthopterygian Fishes, &c., vol. ii. p. 324.

Habitat.—Chinese seas.

TRICHIDION HEPTADACTYLUS.

Polynemus heptadactylus *Cuv. et Val.*, Hist. Nat. des Poissons, tom. iii. p. 390.

Habitat.—East Indian seas.

TRICHIDION MELANOCHIR.

Polynemus melanochir *Cuv. et Val.*, Hist. Nat. des Poissons, tom. vii. p. 513.

Habitat.—East Indian seas.

Species with six pectoral filaments.

TRICHIDION HEXANEMUS.

Polynemus hexanemus *Cuv. et Val.*, Hist. Nat. des Poissons, tom. iii. p. 389.

Habitat.—East Indian seas.

TRICHIDION PFEIFFERI.

Polynemus Pfeifferi *Bleeker*, Natuurkundig Tijdschrift voor Nederlandsch Indie, iv. p. 249, 1853.

Habitat.—Sea of Priaman, Sumatra.

TRICHIDION SEXTARIUS.

Polynemus sextarius *Bloch*, Systema Ichthyologiæ, *Schneid.* ed. p. 18, tab. iv.

Habitat.—East Indian seas.

TRICHIDION XANTHONEMUS.

Polynemus xanthonemus *Cuv. et Val.*, Hist. Nat. des Poissons, tom. vii. p. 517.

Habitat.—Coast of Coromandel.

TRICHIDION APPROXIMANS.

Polynemus approximans *Lay & Bennett*, Beechey's Voyage to the Pacific, Zoology, p. 57.

Habitat.—Western coast of Mexico.

TRICHIDION KURU.

Polynemus kuru *Bleeker*, Natuurkundig Tijdschrift voor Nederlandsch Indie, deel iv. p. 609, 1853.

Habitat.—Sea of Ternate.

TRICHIDION DIAGRAMMICUS.

Polynemus diagrammicus *Bleeker*, Bijdrage tot de kennis der Percoiden van den Malajo-moluskschen Archipel, p. 60, in Verhandelingen van het Bataviaasch Genootschap, deel xxii.

Habitat.—Java.

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TRICHIDION SEXFILIS.

Polynemus sexfilis Cuv. et Val., Hist. Nat. des Poissons, tom. vii. p. 515.

Habitat.—Isle of France.

Species with five pectoral filaments.

TRICHIDION INDICUS.

Indian Polyneme.

Polynemus indicus. } Shaw, General Zoology, vol. v. pt. i. pp. 226, 381.

Polynemus sele Hamilton, (Buchanan), Account of the Fishes of the Ganges, pp. 226, 381.

Polynemus uronemus Cuv. et Val., Hist. Nat. des Poissons, tom. iii. p. 385.

Polynemus plotens O'Reilly, Calcutta Journal of Nat. Hist. vol. iii. p. 450.

Polynemus gelatinosus McClelland, Calcutta Journal of Nat. Hist. vol. iii. p. 181.

Habitat.—East Indian seas and Australia, (Günther.)

The preceding appear to be the only names under which this species has been described. The names of *Polynemus sele*, *P. plebeius*, *P. lineatus* and *P. gelatinosus* have been so recorded in the synonymy by some authors as to lead to the inference that they had been applied to as many nominal species by McClelland. That Gentleman, however, expressly stated that they were synonyms of one species for which he proposed the name of *P. gelatinosus*.

TRICHIDION TAENIATUS.

Polynemus taeniatus Günther, Catalogue of the Acanthopterygian Fishes, &c., vol. ii. p. 526.

Polynemus lineatus Günther, op. cit., vol. ii., p. 327, (not *Polynemus lineatus* Lacépède.)

Habitat.—Seas of Amboyna and Guataleana.

TRICHIDION MICROSTOMUS.

Polynemus microstomus Bleeker, Natuurkundig Tijdschrift voor Nederlandsch Indie, vol. ii. p. 217.

Habitat.—East Indian Archipelago.

TRICHIDION PLEBEJUS.

Polynemus plebejus Linn., Systema Naturæ, Gmelin ed., p. 1401.

Polynemus lineatus Lacépède, Hist. Nat. des Poissons, tom. v. pl. xiii. fig. 2.

Nilotic polyneme Shaw, General Zoology, vol. v. pt. 1, p. 151.

Trigla Asiatica Forster, Descriptiones Animalium, &c., curante Lichtenstein, p. 236, 1844.

Habitat.—East Indian seas.

Species with four pectoral filaments.

TRICHIDION TETRADACTYLUS.

Four fingered polyneme, } Shaw, General Zoology, vol. v. p. 155, 1804.

Polynemus tetradactylus, }
&c., pp. 224, 381.

Polynemus salliah, } Cantor, Journal of the Asiatic Society, vol. v.
Polynemus quadrifilis, } p. 166.

Habitat.—East Indian seas.

TRICHIDION QUADRIFILIS.

Polynemus quadrifilis Cuv. et Val., Histoire Naturelle des Poissons, tom. iii. p. 390, vii. p. 518, pl. 68.

Habitat.—Western coast of Africa.

Species with three pectoral filaments.

TRICHIDION TRIDACTYLUS.

Polynemus tridactylus Bleeker, Bijdrage tot de kennis der Percoiden van

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den Malaijo-molukschen Archipel, p. 57, (in Verhandelingen van het Bataviaasch Genootschap, del xxii.
Habitat.—Seas of Batavia.

POLISTONEMUS Gill.

Polynemus sp. *Schlegel, Pel., Bleeker, Günther.*

Dentes velutini maxillis ambabus et ossibus vomerino, palatinis et pterygoideis. Filamenta pectoralia circiter 14.

Body oblong, covered with small scales. Head oblong, with the snout projecting. Preoperculum serrated. Both jaws, the vomer, palatine and pterygoid bones provided with villiform teeth. First dorsal fin above the pectorals, and furnished with seven or eight spines. Second dorsal and anal fins oblong, opposite and nearly equal. Pectoral filaments numerous (about fourteen) and much elongated.

The present genus is closely allied to *Trichidion*, but is sufficiently distinguished by the greatly increased number of the pectoral filaments. The scales are also considerably smaller than those of the *Trichidions*.

POLISTONEMUS MULTIFILIS Gill.

Polynemus multifilis Schlegel, Fauna Japonica Pisces, p. 29, (note); *ib.* in *Bijdragen tot de dierkunde*, vol. i. p. 11, pl. vi.

Polynemus quatuordecimalis Pel., *Bijdragen tot de dierkunde*, vol. i. p. 10.

Polynemus polydactylus Bleeker, Natuurkundig Tijdschrift voor Nederlandsch Indie, Jahrgang iii. 1852, p. 417.

Habitat.—River and coast of Borneo.

GALEOIDES Günther.

Galeoides Günther, Catalogue of the Acanthopterygian Fishes, &c., vol. ii. p. 332.

Polynemus Vahl, Bloch, Cuv. et Val.

Dentes velutini solum maxillis ambabus et ossibus palatinis. Filamenta pectoralia circiter 10 vel 11.

Body oblong and compressed, covered with moderate or rather large scales. Head oblong, with the snout high and obtuse. Eyes large. Preoperculum serrated. Both jaws and the palatine bones armed with villiform teeth; the vomer and pterygoid bones are edentulous. First dorsal fin above pectorals, sustained by about eight spines. Second dorsal and anal oblong, opposite and nearly equal. Pectoral filaments in moderate number, generally about nine or ten.

Galeoides is distinguished by the absence of vomerine and pterygoid teeth, and by the moderate size of the anal fin. Cuvier and Valenciennes have described two nominal species with those characteristics distinguished by the presence of nine or ten pectoral filaments. Dr. Günther has considered them as identical, and as there is every probability that, where the number is so increased as it is in this genus, there should be a slight variation in the number in the same species, we have concluded to adopt his views. We have only seen the variety or species with nine filaments.

GALEOIDES POLYDACTYLUS Günther.

Polynemus polydactylus Vahl, in *Skriv. Naturh. Selsk*, vol. iv. p. 158.

Polynemus enneadactylus Cuv. et Val., *Hist. Nat. des Poissons*, tom. iii. p. 392.

β *Polynemus decadactylus Bloch, Naturgeschichte der Ausländischen Fische*, taf. cccci.

Habitat.—Western coast of Africa.

1861.]

Synopsis of the Eastern American Polynematoids.

POLYNEMUS QUINQUARIUS Linn.

Synonymy.

- Polynemus Gronovius, Museum Ichthyologicum, vol. i. p. 31, No. 74.
 Pentanemus Artedi, in *Seba's Locupletissimi Rerum Naturalium Thesauri accurata Descriptio*, p. 74, pl. xxvii. fig. 2.
 Polynemus quinquarius Linn., Systema Naturæ, ed. x. tom. i. p. 317, 1758.
 " " Linn., Systema Naturæ, ed. xii. tom. i. p. 521, 1766.
 Le Pentadactyle Daubenton et Haüy, Encyclopédie Méthodique, tom. iii. pp. 292, 314, 1787.
 Le Pentadactyle (P. quinquarius) Bonnaterre, Tableau Encyclopédique et Méthodique, &c., Ichthyologie, p. 182, pl. 74, 1788.
 Polynemus quinquarius Linn. Systema Naturæ Gmelin, ed. (tom. i. pt. iii.) p. 1400. 1788.
 " " Artedi, Genera Piscium Walbaum, ed. p. 630. 1792.
 " " Bloch, Systema Ichthyologiæ, Schneider ed. p. 19, 1801.
 Le Polynème pentadactyle } Lacépède, Histoire Naturelle des Poissons, tom.
 Polynemus quinquarius } v. pp. 412, 415, 418, 1803.
 Seban Polynème }
 Polynemus quinquarius } Shaw, General Zoology, vol. v. p. 149, 1804.
 Polynemus Artedii Bennett, Proc. of the Committee, &c., of the Zoological Society of London, pt. i. p. 146.
 Polynemus macronemus Pel., Bijdragen tot de dierkunde, vol. i. pp. 9, 10, pl. vi.
 Polynemus quinquarius, Catalogue of Fish, collected and described by Gronovius, now in the British Museum, p. 176.
 Pentanemus quinquarius Günther, Catalogue of the Acanthopterygian Fishes, &c., vol. ii. p. 331, 1860.

D. VI. 11. I. 15. A. II. 30.

The lateral line runs through seventy or more scales; above are six rows, and below seventeen rows.

There are five very long pectoral filaments, their length being twice as great as that of the body.

If the American and African representatives of this genus have been correctly referred to one species, the geographical range of that one is very wide. The habitat of the species was given neither by Artedi in the Thesaurus of Seba, nor by Gronovius in the Museum Ichthyologicum. It was first said to inhabit the American seas by Linnæus in the tenth edition of his Systema Naturæ, and the same locality is given by Gronovius in a work that was long unprinted; but which has been recently published by the British Museum. If the American and African species are distinct, Bennett's name of *Polynemus Artedii* must be therefore retained for the latter. Bennett alluded to the discrepancies between the figures and descriptions of Gronovius and Artedi, and the characters of the African species, but as Dr. Günther, with specimens from both localities before him has unhesitatingly united them under one, without comment, it is probable that there is no real difference. The species may therefore for the present be combined.

TRICHIDION OLIGODON Gill.

Synonymy.

- Polynemus oligodon Günther, Catalogue of the Acanthopterygian Fishes, &c. p. 332.

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Doubtful Synonymy.

- Polynemus virinicus* Linn., *Systema Naturæ*, ed. x. tom. i. p. 317.
 “ “ Linn., *Systema Naturæ*, ed. xii. tom. i. p. 521.
 Le Mango *Daubenton et Haiiy*, *Encyclopédie Méthodique*, tom. iii. pp. 244, 314.
 Le Mango (*P. virinicus*) *Bonnaterre*, *Tableau Encyclopédique et Méthodique*,
 &c., *Ichthyologie*, p. 182.
Polynemus virinicus Linn., *Systema Naturæ*, *Gmelin* ed. (tom. i. pt. iii.)
 p. 1400. 1788.
 “ “ *Artedi*, *Genera Piscium*, *Walbaum* ed. p. 630. 1792.
 “ “ *Bloch*, *Syst. Ichthyologiæ*, *Schneider* ed. p. 19. 1801.
 Le Polynème mango { *Lacépède* *Histoire Naturelle des Poissons*, tom. v. pp.
Polynemus mango { 413, 417, 418. 1803.
Virginian Polyneme *Shaw*, *General Zoology*, vol. v. p. 156.

D. VIII. 1, 13. A. II. 15.

The lateral line runs through seventy scales; above it there are seven rows and beneath are fourteen. There are seven pectoral filaments of moderate length, and nearly coterminous with the pectoral fins. The villiform teeth of the palatine and pterygoid bones form a narrow band. The body is uniform silvery. The margins of the pectoral fins and top of the first dorsal are black, and the rest more or less minutely dotted with black, (Günther.)

This species has quite a large geographical range, having been discovered on the southern coast of Brazil (at Rio Janeiro) and at the West Indian island of Jamaica. It is perhaps also found on the coast of the Southern United States. Its radial formula better agrees with that assigned by Linnæus to his *Polynemus virinicus* than does the *Polynemus Plumieri*. It does not, however, appear to be admissible to retain the Linnæan name for the species, as there is much uncertainty about it, and the description of Linnæus is incorrect, a pointed tail being assigned to it. Such a character is almost impossible in a fish having the form of a *Polynemus*.

TRICHIDION PLUMIERI Gill.

Synonymy.

- Piracoaba* *Marcgrave*, *Historia Naturalis Brasilæ*, p. 176.
 “ *Willoughby*, *Hist. Piscium*. (Lib. iv.) p. 204, tab. N. 13, f. 3. 1686.
Trichidion *Klein*, *Historia Piscium Naturalis promovendæ* *Missus quintus*,
 p. 29. 1749.
Polynemus paradiseus } *Bloch*, *Naturgeschichte der Ausländischen Fische*,
Der Paradisfisch } tom. xii. p. 28, taf. cccii. (excl. syn.) 1793.
Polynemus paradiseus *Bloch*, *Systema Ichthyologiæ*, *Schneider* ed. p. 18.
Polydactylus Plumieri *Lac.*, *Hist. Nat. des Poissons*, tom. v. p. 419.
Paradise Polyneme (part) *Shaw*, *General Zoology*, vol. iv. p. 147, pl. 118,
Plumier's Polyneme *Shaw*, op. cit. vol. iv. p. 157. 1804.
Polynemus americanus *Cuv. et Val.*, *Hist. Nat. des Poissons*, tom. iii. p. 393.
 “ “ *Storer*, *Synopsis of the fishes of North America*, p. ,
 ib. in *Memoirs of the American Academy of*
Arts and Sciences, vol. ii. p. 300. 1846.
 “ “ *Schomburgh*, *History of Barbados*, p. 697. 1848.
 “ “ *Hill*, *Catalogue of the Fish of Jamaica*.
 “ “ *Guichenot*, *Hist. physique politique et Naturelle de*
l'île de Cuba, p. 44. 1853.

Polynemus Plumieri *Günther*, *Catalogue of the Acanthopterygian Fishes*,
 vol. ii. p. 321.

Trichidion Plumieri *Gill*, *Catalogue of the Fishes of North America*.

D. VIII. I. 12. A. II. 12—13.

The lateral line runs through about sixty scales or less; above it, there are six rows, and beneath, ten.

1861.]

The seven pectoral filaments are moderately long, and nearly coterminous with the fins. The villiform teeth of the palatine and pterygoid bones form a broad band. The pectoral fins are black.

The *Trichidion Plumieri* is generally distributed through the Caribbean sea, and appears to be there the most abundant species. Its claim to be considered as an inhabitant of the coast of the Southern United States is rather doubtful.

TRICHIDION OCTOPILIS Gill.

D. VIII. I. 11. A. II. 14.

The lateral line runs through sixty scales; there are six rows above and ten below.

The eight pectoral filaments are moderately elongated; the longest reaches midway between the two dorsal fins. The color is apparently a nearly uniform silver. The vertical fins, and especially the first dorsal, are punctulated with black. The pectoral fins are quite black.

The present species has been only found at New York.

TRICHIDION OCTONEMUS Gill.

Synonymy.

Polynemus octonemus Girard, *Proceed. of the Academy of Natural Sciences of Phila.*, 1858, p. 167.

“ “ *Girard*, *United States and Mexican Boundary Survey, Ichthyology*, p. 19, pl. x. figs. 5-9.

“ “ *Günther*, *Catalogue of the Acanthopterygian Fishes, &c.*, vol. ii. p. 320.

D. VIII. I. 12. A. II. 13.

The lateral line runs through sixty or sixty-two scales; the scales themselves are arranged in seventeen longitudinal rows, of which six are above and ten beneath the lateral line.

There are eight pectoral filaments, the upper and longest of which extend behind the first rays of the anal fin. The color of the body is silvery on the sides, and light brownish yellow on the back above the lateral line. The fins are whitish and immaculate.

This very distinct species has been as yet only detected in Texas.

Description of Trichidion octopilis, a new species.

TRICHIDION OCTOPILIS Gill.

The body has the same ordinary form and degree of elongation as its congeners. The greatest height surpasses a quarter of the entire length from the snout to the end of the median caudal rays (27-100); the least height of the caudal peduncle does not quite equal an eighth of the total length (12-100).

The length of the head exceeds a quarter of the total (26-100), and is much greater than its height. The snout is much produced; the distance between its extremity and the anterior margin of the orbit is equal to a sixth or seventh of the length of the head (4-100); that between the snout and the margin of the preoperculum above its angle equals seventeen twenty-sixths of the same (17-100). The eyes are large; the longitudinal diameter of the orbit is equal to more than a quarter of the head's length (7-100). The interorbital area equals the orbit's diameter. The front of the lower jaw is at the vertical from the anterior border of the eye. The upper maxillary, as in all the species of the family, passes far behind the orbit, and is contained nearly two and two-third (2.8-11) times in the head's length. The preoperculum has a larger spine at its angle, and its posterior margin is pectinated.

The first dorsal fin is subfalcate; it commences behind the vertical from the seventh scale of the lateral line; the length of its base nearly equals a ninth

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of the total (15-100); its first spine is, as usual, rudimentary; its second and third are nearly equal, and each is contained six and two-third times in the total length (11-100); its last spine is less than a third as long as the second. The second dorsal has a longer base than the first (13-100); its longest ray exceeds $6\frac{3}{4}$ of the total length (15-100); its last one exceeds a fifteenth of the same ($6\frac{1}{2}$ -100). The interval between the two dorsals is nearly equal to a sixth of the total length (16-100).

The anal fin is subfalciform like the second dorsal; its length nearly equals a sixth of the total (16-100) and the interval between the dorsal fins; its longest ray, when entire, probably equals the same (in specimen (14-000), and the last a half of it.

The caudal fin has the usual form; its median rays equal a tenth (10-100), and its longest nearly two-sevenths (28-100) of the total length.

The pectoral fins are also proportioned like those of the other species; their greatest length exceeds a fifth (21-100) of the total.

There are eight pectoral filaments; the second superior one is slightly longest, and extends nearly to the vertical from the middle of the interval between the dorsal fins; its length nearly equals two-sevenths (28-100) of the total; the inferior or shortest has about half the length of the longest (14-100).

The ventral fins are situated under the anterior or median spines of the first dorsal; the length of the spine little exceeds a seventeenth (6-100) of the total; that of the external branched ray nearly equals a ninth (11-100), and that of the interval a tenth (10-100) of the same.

The radial formula follows:

1st. D. VIII. 2d. D. I. 11. A. II. 14.

The lateral line runs through about sixty scales; there are six rows above, and apparently ten below.

The color appears to have been silvery. The vertical fins, especially the first dorsal, are punctulated with black. The pectoral fins are almost totally black.

Total length $7\frac{1}{2}$ inches.....	100
Greatest height.....	27
Least height.....	12
Length of head.....	26
Distance between snout and preoperculum.....	17
“ “ “ orbit.....	4
Diameter of orbit.....	7
Distance between orbits.....	7
Length of first dorsal fin.....	11
“ second spine.....	15
“ last spine.....	$4\frac{1}{2}$
Length of second dorsal fin.....	13
“ longest ray.....	15
“ last ray.....	$6\frac{1}{2}$
Distance between dorsals.....	16
Length of anal fin.....	16
“ longest ray.....	14
“ last ray.....	8
Length of central caudal rays.....	10
“ longest caudal rays.....	28
Length of pectoral fins.....	21
“ longest pectoral filament.....	28
“ shortest pectoral filament.....	14
Length of ventral spine.....	6
“ external ventral ray.....	11
“ internal ventral ray.....	10

A single specimen of this new species was obtained several years ago at New York, and is now in the possession of Mr. J. Carson Brevoort, to whom I am indebted for the privilege of describing it. The species is readily distinguished from all its congeners, except *Trichidion octonemus*, by the number of its pectoral filaments. From that species, it is very distinct, the color being quite different and the pectoral filaments themselves more elongated. Its affinity with the *Trichidion Plumieri* is greater, its color being nearly similar, but that species is distinguished from the present by the number of its filaments and its proportions.

Homoptera of the North Pacific Exploring Expedition under Com'rs. Rodgers and Ringgold.

BY P. R. UHLER.

PLATYPLEURA Amyot et Serv.

P. FENESTRATA.—Piceous: head tawny, with a black band, which is quadrately prolonged backwards upon the middle to the base, also a linear prolongation scarcely half way between the middle and the eyes, surface behind the eyes, the interior margin of the eyes connecting with the band, and an irregular spot each side of the front, black; vertex yellowish, with a transverse black spot, face blackish, covered each side with golden pubescence, the lateral margins, a large spot at base, and the transverse rugæ interruptedly yellow; rostrum yellow, tinged with piceous at tip; stemmata yellow with a black disk; basal joints of the antennæ piceous, remaining joints —: prothorax tawny, the posterior lobe olivaceous, a longitudinal spot behind the head, an anteriorly trifurcate one against the posterior lobe, and the lateral sub-margin black; mesothorax tawny, with four triangular black spots, of which the two interior ones are not more than one-half the length of the others, a longitudinal spot upon the middle, which is dilated each side behind, and a round impressed point each side of it, also black, the exterior triangular spots are connected posteriorly with a piceous spot, which occupies the transverse excavation; metathoracic cross broadly emarginated posteriorly: tergum blackish-piceous, clothed each side with golden pubescence, the posterior margins of the basal segments each side, and the drum-covers yellowish, the posterior margins of the segments ciliated with whitish hairs; venter pale piceous, the segments margined with yellowish, opercles yellowish, pubescent, blackish at base; pectus densely yellowish pubescent; legs pale piceous, tips of claws black; fore wings tawny upon the corium, subhyaline from thence to tip, a broad brown wavy band traversing the wing at the middle of the front areolet, the basal areolet, a spot upon the costal margin not far from the base, and another near the apex of the front areolet, deep brown. a dusky band traverses the wing at the middle, and vestiges of the same color are continued against the corium; a dusky cloud towards the apex extends more than half way across the wing, and a smaller dusky spot at tip is subconfluent with the former, the tips of the longitudinal veins at the exterior margin have a series of geminate brown spots, veins tawny-piceous towards the tip; hind wings tawny-orange, the veins deeper, a brown transverse spot beyond the costal middle, and the exterior margin broadly and wavedly, from the spot, brown, nervures brown, the one separating the flap broadly margined with dusky: coxal valves long, very narrow, triangular, subquadrately dilated at base.

Length 10 lines. Alar expanse 30½ lines.

Hab.—Simoda, Japan.

This may be a variety of *P. hilpa*, Walker, but in the absence of direct comparison with the type it is impossible to decide.

FIDICINA Amyot et Serv.

F. ATRATA, Fab. Syst. Ent. 681, 15; Ent. Syst. iv. 24, 28. Donovan Ins.

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China, pl. 15, p. 31. Hong Kong, China. This species varies in the shape and direction of some of the nerves of the hemelytra, and in the coloring, particularly of the wings, but a comparison of the genital organs, &c., will satisfy any one of the identity of the species.

CICADA (Linn.) Amyot et Serv.

C. PELLOSOMA.—Pale ochreous or tawny; head with the eyes as broad as the thorax, dusky piceous above, with an ochreous band upon the anterior margin not quite reaching the eyes, a spot of the same color behind the stemmata, where there is an interrupted, longitudinal, impressed line; clypeus bounded posteriorly by a transverse sulcus, each side with an arcuated impression, and the anterior middle obsoletely, longitudinally impressed, foveolated each side above the antennæ; face dusky, clothed with golden pubescence, the sides and middle of the front, and base of the rostrum honey-yellow; rostrum reaching to the middle coxæ, pitchy towards the tip, tip blackish; stemmata red; antennæ honey-yellow, tinged with piceous at base: prothorax a little broader posteriorly, subquadrate, the lateral margins moderately dilated and recurved, anteriorly obliquely rounded, posteriorly a little roundly emarginated, fuscous, with a middle, longitudinal line and the posterior and lateral margins yellow; mesothorax fuscous upon the middle to the base, W-shaped lines yellow: opercles subreniform, rounded posteriorly, about one-third the length of the abdomen, abdomen longer than broad, sublanceolate: beneath pale piceous; basal tooth of the anterior femora cylindrical, very oblique, long, acute, two smaller, straighter ones near the tip.

First transverse nerve straight, second oblique, forming an angle of about 45°, third almost straight forming a right angle, fourth curved inwardly, hardly oblique, fifth curved outwardly.

Length to tip of abdomen $6\frac{1}{2}$ lines. Alar expanse 15 lines.

Hab.—Hong Kong, China.

The front is traversed by about seven transverse ridges, and the longitudinal sulcus is about two-thirds the length of the front; the female is paler than the male, and has the dorsal, thoracic spot replaced by four deltoid ones, the exterior ones of which are much larger than the others.

MOGANNIA Amyot et Serv.

1. *M. illustrata*, Amyot et Serv. Hemipt. 467, 1. Hong Kong, China.

2. *M. indicans*, Walker, Brit. Mus. Cat. Homopt. p. 249, 3. Hong Kong, China.

3. *M. histrionica*.—Piceo-rufous: densely covered with short pile; head ochraceo-fulvous, rostrum and each side of the epistoma tinged with piceous; face hairy, stemmata red: prothorax fulvous, more brightly so upon the posterior lobe, each side of the disk with a large rufo-piceous spot; mesothorax tinged with ferrugineo-piceous, excepting the sides; metathorax fulvous, barely emarginated posteriorly; abdomen piceo-rufous, the segments each side upon the incisures, tinged with fulvous, the apical segment with an erect, subcylindrical tooth superiorly, each side of which is a deep colored spot. beneath fulvous: wings subhyaline, the anteriors with a fuscous spot reaching beyond the middle, convex upon its exterior margin and only reaching the basal areole interiorly, the veins, base, costal margin and a transverse band near the apex of the spot, pale yellow, necks of the wings not reddish: pectus blackish-piceous; legs bluish-black, pubescent. Female.

Length $6\frac{1}{2}$ lines. Alar expanse 15 lines.

The male is paler in coloring, especially upon the thorax, and the transverse yellow band of the fore wings is more spread upon the middle surface and margins of the veins; also less hairy; the opercles are transverse, reniform, fuliginous.

Hab.—Hong Kong, China.

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HUECHYS Amyot et Serv.

H. SANGUINEA, De Geer, Mem. Ins. iii. 221, pl. 33; fig. 17. Hong Kong.

CENTROTUS Fab.

Fragments of a species belonging to this genus, perhaps *C. taurus*, Fab., were contained in the lot from Hong Kong, but they were too incomplete to distinguish the species with certainty.

CERCOPIS Fab.

1. *C. heros*, Fab. Syst. Rhyng. 89, 3. Hong Kong, China.2. *C. bimacula*, Walker, Brit. Mus. Cat. Homopt. 656, 25. Hong Kong, China.

Descriptions of four species of HEMIPTERA collected by the North-Western Boundary Survey.

BY P. R. UHLER.

Suborder HETEROPTERA.

CORIZUS Fieb.

C. BOREALIS.—Pale fuscous, clothed with whitish hair; head narrow, eyes but little prominent, basal joint of the antennæ with a black spot beneath, and pointed above with black, as are also the two following joints, apical joint thicker, about equal in length to the preceding joint, dusky; a black arcuated spot between the ocelli and eyes, and a spot of the same color upon the ocelli; rostrum yellow, with a black longitudinal line; thorax coarsely, confluent punctured, the pectus with a spot, and an arcuated line behind the eyes, black, anterior margin of the prothorax blackish, lateral margins slightly sinuated before the middle, scutellum coarsely punctured, dusky at base, a longitudinal line at the base and the lateral margins smooth, yellowish, the apex with a rounded concave impression; corium semitransparent, pale yellowish, with a few small dots upon the longitudinal nerves, and two geminate, confluent spots at the anastomosis, black; principal nervures of the wings black; tergum black, finely, closely punctured, the last segment yellow, with a longitudinal spindle-shaped black mark upon the middle, and three sub-sutural ones each side, penultimate segment with a subtriangular, yellow spot each side, the antepenultimate segment with an oblong, yellow spot upon the middle, connexivum with a subquadrate black spot upon each segment, which are also seen beneath; venter with two somewhat approximate, black points, each side of the middle, upon the three discoidal segments, basal middle of the last segment with an obscure black point; legs pointed with black, the points confluent upon the posterior femora, forming a black patch, apices of the tarsal joints and the nails black.

Length 8 millims. Humeral breadth $2\frac{3}{4}$ millims.

A single female was collected by the expedition, east of Fort Colville. I have also examined specimens obtained by Mr. Kennicott, in Arctic America.

CORIXA Geoff.

C. VULNERATA.—Blackish fuscous, upper surface uniformly rostrated; front convex, hardly prominent, mouth dusky, eyes triangular, reddish brown, face with very long golden yellow hairs, vertex with four longitudinal rows of large punctures, occiput lightly carinated, acutely produced in the middle; prothorax obtusely rounded posteriorly, yellow, with seven black lines, two of them forked, posterior ones a little curved; lines of the clavus yellow, basal

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ones entire, those behind the base interrupted at the inner suture, a few of the middle ones broken; lines of the corium rather direct, broken, subparallel, oblique line at the membrane yellow, membrane with very serpentine lines, radiating towards the interior margin, which they do not reach; marginal area yellowish white; wings milk white; tergum black, connexivum yellow, with black incisures; beneath yellowish white, venter dusky at base; legs yellowish white, tip of the basal tarsal joints of the middle feet, black, a broad black band upon the tarsi of the posterior feet, palæ cultriform, slightly arcuated at the tip, rather broad, hardly broader in the middle, ciliæ moderately long. Female

Length $7\frac{1}{2}$ millims.

Two specimens were obtained near Chiloweyuck Depot, Washington Territory. The species is remarkable for having very fine scratched, transverse lines bounding some of the lines of the thorax.

Suborder HOMOPTERA.

CICADA Linn.

C. AREOLATA.—Black, with a slightly æneous tinge; head sordid black, having a marginal subtriangular, orange spot above the antennæ, hypostoma very prominent, rounded, convex, the longitudinal sulcus dilated near its middle, at each end becoming less defined, the transverse elevated lines slender, distant, the intervals flat, shallow; face clothed with long white hairs; rostrum blackish, orange upon the middle; apical joint of the antennæ yellow; eyes very prominent, pedunculated; superior aspect of the prothorax transversely quadrate, the posterior angles but slightly produced, the lateral margins obtusely angulated in the middle, hardly emarginate before the posterior angles, the posterior margin truncated, orange; surface rugous, with a longitudinal, slightly impressed orange line upon the middle; mesothorax black, shining; elevated posterior margin of the metathorax, including the two posterior branches of the elevated X, orange; hemelytra broad, obtuse, dilated upon the costal margin to the tip of the first marginal areolet, costa and two posterior longitudinal veins at base, yellow, remainder of the veins piceous, veins of the wings yellow, piceous at tip, excepting the middle longitudinal one, which is piceous almost to the base; tergum black, shining, with scattered white hairs, last segment with a long slender tooth superiorly; venter sordid black, densely hairy; lateral pieces of the antepectus orange; legs orange, the anterior femora black beneath, armed with two long, rather straight, acute spines; the knees, a line upon the tibiæ above, the tarsi, and tips of all the nails piceous; two foliaceous, rather thick, elongate-oval appendages at the caudal extremity beneath the tooth, the superior one much shorter than the other, and lying applied against it. Female

The male has no tooth at the caudal extremity, but appendages like those of the female are present; the penis cover is sub-fusiform, carinated above, and with an interrupted groove exterior to the concave sulcus present upon each side of the middle; the last ventral segment is extremely elongated, sheath-like, hairy, rufo-piceous; the drums and sonory apparatus are merely rudimental.

Length 21 millims. Alar expanse 50 millims.

Found east of Fort Colville in Washington Territory. This species is very remarkable from the abortive appearance of the drums, and it is highly probable that the species is without a note. In the specimens noticed and captured, no note was observed to be produced.

PROCONIA Amyot et Serv.

P. CONFLUENS.—Blackish, slender; face white, front rather prominent, convex, two maculose, irregular, longitudinal lines upon the middle, a dot at 1861.]

base and apex, a few small spots about the tip, and the transverse striæ blackish or piceous; labrum with a short black line; rostrum tinged with piceous at tip and near the base, antennæ yellow at base, piceous at tip, situated upon a dusky spot, upper surface of the head black, a white abrupt line at the vertex, two abrupt longitudinal ones upon the disk, an abrupt transverse one on the middle of the posterior margin, almost connected with the discal ones, and a few minute spots, whitish yellow, discal impression shallow; thorax nigro-piceous, or fuscous, with five maculose, irregular, yellowish stripes, the exterior ones curved inward anteriorly, anterior margin yellow, and behind and against it are many small yellow marks and dots; pectus yellowish white, with black spots, a large black spot upon the pleura, behind the eyes; hemelytra blackish fuscous, with numerous yellowish white short streaks and flecks, especially upon the suture of the clavus, costal margin and interior edge of the clavus yellowish-white, interior apical areole of the membrane fuliginous, with a fuscous nervule; wings dark fuliginous; scutellum black, with a short apical line, the exterior edge and two spots upon the disk, yellowish-white; abdomen black, with the incisures of the segments yellowish-white; legs yellowish white, with white spines to the posterior tibiæ, base and apex of the posterior femora, the apices of the tarsal joints minutely, and the nails, fuscous.

Length $5\frac{1}{2}$ millims. Alar expanse 13 millims.

Collected in the North-Western part of Washington Territory.

It is much less robust than *P. costalis*, Fab., which it most resembles.

Rectification of the paper upon the HEMIPTERA of the North Pacific Expedition.

BY P. R. UHLER.

My paper in the Proceedings for 1860 is very full of errors, owing to my not having received the proof in time to correct it before its passage through the press. There are many typographical and orthographical errors which the reader can correct for himself; but the specific name was omitted from the description under *ORTHÆA*, which must be *ORTHÆA MACULIFERA*, page 228. In the introductory remarks, page 221, the expression:—"genera *Pentatoma* and *Coreus* of Fabricius," should read:—"genera *Pentatoma* of Latreille, and *Coreus* of Fabricius.

The genus *EUCORYSSES* not being distinct from *Callidea*, the species described on page 221, must be referred to it, and as the specific name will thus be pre-occupied, it may be called *C. distinguenda*. The species of *ACANTHOSOMA* is wrongly referred to *hæmatogaster* Burm., and is an undescribed species:—It may be called:—

ACANTHOSOMA VICINUM.—Olivaceous-yellow, coarsely punctured with black; head densely, confluent punctured, central lobe as long as the lateral ones; rostrum pale luteous, piceous at tip, antennæ pubescent, luridly luteous, the last joint and the middle of the preceding one piceous, ocelli red; thorax very coarsely, confluent, deeply punctured, particularly in occasional impressions of the surface, punctures rather sparse upon the disk, but much finer and extremely dense upon the humeri, humeral angles very prominent, subacute, emarginated behind, black, bounded interiorly with reddish; lateral margins of the thorax slightly sinuated, broadly impunctured. Scutellum sparsely, but very coarsely punctured, the apex not margined with yellow; corium impunctured upon the disk, the remaining surface rather finely, and in spots confluent, punctured; membrane fuliginous, with some large white spots; wings tinged with fuliginous: tergum reddish-brown, the lateral margins yellow, with three quadrate black spots, behind which are two black points: pectus rather finely, confluent punctured with black: venter yellow, polished, with a few scattered black punctures each side, the last segment and append-

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ages pitchy, ventral spine slightly surpassing the posterior coxæ: less honey-yellow, tips of the tarsi piceous.

Length to tip of membrane 7 millim. Humeral breadth 4 millim.

Hab. Hong Kong, China.

The generic name *PACHYCEPHALUS*, page 225, is preoccupied and may be changed to *HYGIA*; the species will then be *HYGIA OPACA*.

The name *ANACANTHUS*, page 227, is also preoccupied; it may be changed to *ANACANTHOCORIS*.

Descriptions of Nine New North American LIMNOBIACEÆ.

BY BARON R. OSTEN SACKEN.

Since the publication of my paper on the *N. A. Tipulidæ with short palpi* (in the Proceedings of the Academy for August, 1859,) my opportunities for collecting have been very limited, and in consequence of this, the number of new species discovered is not as large as I might have desired.

The following descriptions embrace five new species found by myself, two collected by Mr. Alex. Agassiz, in California, and two by Mr. Robt. Kennicott, in the northwestern parts of the possessions of the Hudson's Bay Company.

Several other new species in my collection I do not venture to describe, the number of specimens not being sufficient to establish the specific character. Among them, a *Dicranoptycha*, from California, deserves to be mentioned as a matter of geographical distribution.

I take occasion here to correct two errors which I discovered in the above mentioned paper.

First, That the measurement which I have used are *tenths of an inch*, and not *lines*. I called them lines, because the line used in Russia is equal to one-tenth of the Russian inch, which is the same as the inch used in England and America.

Second, That my *Limnophila pavonina* is the *Limnobia fascipennis* Say. I had failed for a long time to identify this species from Say's description, but am positive now about this synonymy.

DICRANOMYIA Steph.

D. IMMEMOR.—Silacea, thorace pleurisque vittis infuscatis, *alis* immaculatis elongatis, *valde angustis*, areola discoidali aperta; long. 0.25—0.3.

Ochraceous, vertex infuscated, palpi and antennæ brownish, second joint of the latter stout; præscutum with three indistinct brown stripes; the intermediate darker towards the collare; pleuræ with a brown stripe extending from the base of the halteres, across the root of the wing towards the humeri; halteres pale, knob almost imperceptibly infuscated; tergum somewhat brownish; feet pale yellow, tip of tibiæ and the tarsi infuscated; wings very narrow, almost lanceolate, their basal, narrowed portion very long; anal angle small, hardly projecting; their color is subhyaline; stigma elongated, pale, its outline indistinct posteriorly; costal and subcostal veins yellow, the other veins brown; tip of the mediastinal vein a little beyond the origin of the petiole; stigmatal crossvein near the tip of the subcostal vein; radial area considerably longer than the cubital one; the latter longer than the subapical one; discoidal areolet wanting, the space usually occupied by it not being closed by a crossvein; this space is narrow and elongated; the fork, enclosing the second externomedial areolet is short and narrow; axillary vein somewhat undulated.

Numerous ♂ and ♀ specimens on a meadow near the Trenton Falls, N. Y., in September (nob.)

The general habitus of this species is different from the other *Dicranomyiæ*; its very narrow wings with their yellow costal and subcostal veins, forming a contrast with the brown color of the other veins, make it easily recognizable. The structure of its male forceps belongs to the same type with those of the other species of the group.

1861.]

D. MARMORATA.—Cinereo-fusca, thorace vittis tribus fuscis, alis cinereo nebulosis, stigmatibus quadrangularibus, fusco; long. 0.4.

Proboscis, palpi and antennæ brown; joints of the latter subglobular, verticils short; front and vertex cinereous, darker in the middle; thorax cinereous, with three brown stripes; abdomen brownish cinereous, posterior margins of the segments pale; halteres pale; feet yellowish, tips of femora, of the tibiæ and of the tarsi brown; wings subcinereous with some darker clouds and some hyaline bands and spots; a cloud at the origin of the petiole, another, round one, at the tip of the petiole; crossveins also clouded; stigma obscure-cinereous, elongated, quadrangular; the hyaline spots are arranged in the following way: a small rounded one in the anal angle; a band running across the basal portion of the præ-, pabrachial and anal areæ and ending in the axillary near the posterior margin; a spot in the anal area near the tip of the axillary vein; a large irregular hyaline space in the central portion of the wing, enclosing the stigma and the two clouds of the petiole, and extending more or less towards the posterior margin, across the discal and the externomedial areolet; its outline is very indefinite, and it is interrupted by clouded marks along the veins; a small hyaline mark at the tip of the wing, in the cubital vein. The tip of the mediastinal vein almost corresponds to the origin of the petiole; the mediastinal crossvein is a short distance before its tip; the discal areolet is present (closed) and the great crossvein corresponds to its base.

California, two ♂ specimens. (Mr. A. Agassiz.) This species is related to *D. humicola*, O. S.

LIMNOBIA nob.

L. CALIFORNICA.—Thorax vittis quatuor; alæ fuscescentes, pallide fenestratæ, margine anteriore maculis quatuor fuscis; long. 0.7—0.8.

Front and vertex brown; underside of the head and sides of the occiput yellow; proboscis, palpi and antennæ brown; two basal joints of the latter yellow. Thorax yellowish, mixed with brown; præscutum with four brown stripes; the intermediate ones narrow, parallel; at their anterior end, they coalesce with the brown margin to the præscutum, which is broadest at the humeri; lateral stripes abbreviated anteriorly and extending over the scutum posteriorly; scutellum, metathorax and pleuræ more or less tinged with brownish; base and tip of halteres pale, the intermediate portion infuscated; femora brownish; a yellow ring before the tip, which is black; tibiæ ferruginous-brownish, brown at tip; tarsi ferruginous-brownish at the base, the remainder brown. Wings with a brownish tinge; four large brown spots along the anterior margin; the first at the basis of the præbrachial area; the second at the origin of the petiole, somewhat trapezoidal; both do not cross the subcostal vein, and do not therefore reach the anterior margin; the second is limited posteriorly by the præbrachial vein; the third spot is double, consisting of an oblique spot which begins at the margin, just beyond the tip of the mediastinal vein, and coalesces with a round spot at the tip of the petiole (origin of the fork); the fourth spot is at the tip of the subcostal vein; it is semi-oval and is enclosed between the costa and the radial vein; there are several subhyaline spots on the surface of the wing; a large angular one, beginning about the middle of the anal area and reaching the posterior margin at the tip of the axillary vein; smaller ones in the anal angle of the wing, at the tip of the anal vein; in the pabrachial area (near the great crossvein); in the discal areolet; at the tip of the wing, and on both sides of the fourth brown spot. A subhyaline longitudinal streak crosses the second brown spot in the præbrachial area, and the round spot at the tip of the petiole is encircled in pale. The mediastinal veinlet is almost in one line with the tip of the mediastinal vein.

California (Mr. Alex. Agassiz.) Single male.

This species belongs to the group of *L. cinctipes*, *solitaria* and *immatura*, and is most allied to the latter. Still it will be readily distinguished by its greater size, the coloring of the feet and the wings, etc.

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L. PARIETINA.—Brunneo-flavescens; thorace vittis tribus fuscis, media capillari; alæ nebulis, strigis et maculis pallide fuscis; stigmatæ pallido, longo; *venula stigmatali a venarum mediastinalis et subcostalis terminibus æque distans*; long. 0.6—0.65.

Head, proboscis and palpi dark brown; antennæ pale, joints of the flagellum brown at the basis. Præscutum yellow, with three brown stripes; the intermediate is divided by a longitudinal, pale, sometimes hardly apparent line; the lateral ones are abbreviated before and extend over the scutum behind; scutellum and metathorax brownish; pleuræ brownish, mixed with yellow; halteres infuscated, whitish at tip; feet yellowish brown, a pale ring before the tip of femora; the latter pale; tarsi brown. Abdomen brownish; posterior margin of segments and a longitudinal stripe along the middle of the back, pale. Wings with clouds on all crossveins and with pale brown irregular spots in almost all the areæ; *in three or four of the apical areolets these spots assume the shape of an inverted V*. The stigma is very long, pale; the stigmatal crossvein is in the middle of the distance between the tips of the mediastinal and the subcostal vein; the mediastinal crossvein is close at the tip of the mediastinal vein.

The position of the stigmatal crossvein, and the very oblong stigma distinguish this species from all the others of the group. Its antennæ, especially in the living specimens, seems to be 15-jointed, the linear part of the 14th joint being unusually long; still, a careful examination convinced me that there was no articulation to separate this 15th joint.

Trenton Falls, on fences, in September, numerous ♂ and ♀ specimens, (nob).

L. HUDSONICA.—Thorax vittis quatuor, alæ fusco-maculatæ et nebulosæ; maculæ in margine anteriore obscure brunneæ, subopacæ; earum prima duplex; long. 0.5.

Head cinereous above, yellowish-ferruginous below; proboscis and palpi brown; antennæ brown; basal joints yellowish-ferruginous; præscutum with four brown stripes; intermediate ones separated by a yellowish line which is gradually widened anteriorly; halteres with a brown knob; feet (?); wings with brown spots and clouds; four deep brown spots along the anterior margin; the first is double, consisting of two spots, one at the base of the præbrachial area, the other immediately beyond it, connected together by the expansion of the first of them in the pabrachial area; the second spot, at the origin of the petiole, is trapezoidal, the oblique sides being slightly excised; the third, at the tip of the petiole, is oblique and double; the fourth, at the tip of the subcostal vein is rounded; the intervals between the three first of these spots are cloudless, whitish; the clouds on the remaining portion of the wing are exactly like those of *L. immatura*, only their color is more intense; an undulated one runs across the apical portion of the wing, and there are several along the posterior margin. The fork formed by the tip of the mediastinal vein with its crossvein, is like that of *L. solitaria*, that is, the upper branch is longer and oblique, the lower one being short and perpendicular.

Single female from the Slave Lake (Huds. Bay Terr.) by Mr. R. Kennicott.

The resemblance between this species and *L. immatura* is very striking; still they can be distinguished by some very reliable characters. The desire to prevent their confusion induced me to describe this new species, although I have but one imperfect specimen. The principal characters distinguishing them are—1st, the spot at the base of the præbrachial area is simple in *L. immatura*, whereas it is composed of two successive spots, connected as described above, in the other species; 2d, the structure of the mediastinal fork, and perhaps, 3d, the brown knob of the halteres in *L. hudsonica*, whereas in *L. immatura* the upper portion of this knob is pale. Besides, the spots of *L. hudsonica* are of a much more intense brown, contrasting with the pale space between them.

We have now five closely allied species within the genus *Limnobia* proper. 1861.]

As they may be somewhat difficult to identify, the following tabular arrangement will clearly point out their differences.

Upper branch of the fork (formed by the tip of the mediastinal vein, with the mediastinal crossvein), longer, somewhat arcuated; the lower one short, perpendicular.

Two dark brown spots in the basal portion of the præbrachial area, connected together by the expansion of the first of them within the po-brachial area; tips of femora (?) *hudsonica*, O. S.

Brown spot at the basis of the præ- and po-brachial areæ pale and not distinct; a series of more or less numerous dots along the disc of the former area. Tips of femora brown, a pale ring before them.

solitaria, O. S.

Branches of the fork of about equal length.

Surface of the wings brownish, with some pale marks (besides the usual four large brown spots along the anterior margin); tips of femora brown, with a pale ring before them. *californica*, O. S.

Tips of femora yellow, but with a brown ring close before them; wings with brown clouds and spots; an ocellated spot at the posterior end of the stigma. *cinctipes*, Say.

Lower branch of the fork longer, oblique, the upper one being perpendicular; wings marked like in *L. cinctipes*, but the brown spot at the posterior end of the stigma is not ocellated; tips of femora yellow, but with a brown ring close before them. *immatura*, O. S.

TRIMICRA nob.

Proboscis and palpi short. Antennæ of moderate length, 16-jointed; joints of the flagellum, especially the basal ones, subcylindrical, slightly incrassated at the base, with moderate verticils; *three apical joints of the ♂ very abruptly smaller than the preceding ones, subglobular*. Feet long, hairy, moderately stout; without spurs at the tip of the tibiæ. Ungues very small, smooth, *inserted under a projection of the last tarsal joint*. Pulvilli small, but distinct. Wings somewhat elongated, rather narrow; veins arranged more or less like *Limnophila*, or *Cladura*, but no petiolate areolet; petiole long, not arcuated at its origin, which is removed towards the basis of the wing to a point situated some distance before the middle of the wing; *mediastinal crossvein far removed from the tip of the mediastinal vein*, being more than twice nearer to the origin of the petiole than to that tip. Genitals of the ♂ apparently like *Limnophila* (I neglected to make a drawing of them from the living insect.)

The position of this genus in the group of the *Tipulæ eriopteraformes* is evident. It is easily distinguished by the three small-sized terminal joints of its ♂ antennæ. Still, as this character may be less distinctly seen in dry specimens, the position of its mediastinal veinlet, the absence of the petiolate areolet, the form of the petiole, which is not, or is almost imperceptibly, arcuated at its origin, and finally, the form of the male genital organs, will help to distinguish it from *Cladura*. It is allied to *Erioptera* on account of the situation of the mediastinal crossvein, but distinguished from it, besides the structure of the antennæ, by its glabrous wings only very slightly pubescent along the veins.

T. ANOMALA.—Fusco-cinerea, antennis nigris, thorace vittis tribus fuscis, femoribus apice infuscatis; alis immaculatis, modice brunnescentibus; long. 0.3—0.35.

Brownish cinereous; front with a brown line in the middle; antennæ and palpi blackish-brown; præscutum infuscated in the middle, with three dark brown lines, the intermediate one especially distinct; the lateral ones extended over the scutum; scutellum paler; metathorax and pleuræ somewhat hoary; halteres pale, a little infuscated at the basis of the knob; feet hairy, brownish yellow, tip of femora broadly, tip of tibiæ slightly infuscated; tarsi brown, paler at base. Tergum brown, hairy, sides and forceps of the ♂ paler. Wings

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immaculate, slightly tinged with brownish; stigmatical crossveins and the other central crossveins with a slight brown nebula; veins minutely pubescent towards the tip; the stigmatical crossvein starts from the upper branch of the radial vein, immediately beyond the origin of the second radial area; the latter is a little shorter than the cubital area; the subapical area almost of the same length with the preceding one; discoidal areolet narrowed anteriorly, like a truncated triangle; the great crossvein a little anterior to the discoidal areolet.

Washington, D. C., autumn, 1860.

Compared a ♂ and a ♀ specimen; the discoidal areolet of the right wing of the ♂ is abnormally formed, its second lower discal crossvein being removed towards the basis of the areolet, in such a way that the first and second externomedial veins form a petiolate areolet, and the discoidal areolet is very much shortened.

CLADURA O. S.

C. INDIVISA.—Flavo-ferruginea; pleuræ punctis, abdomen fasciis brunneis; alæ subflavescentes; *area cubitali integra* (venula transversa non instructa); long. 0.28—0.3.

Similar in all respects to *C. flavoferruginea*, only the transverse vein in the cubital area is wanting; crossveins and origin of petiole but indistinctly clouded; the size is variable, but generally smaller than in the other species.

When I described *C. flavoferruginea*, I had several specimens of this new species before me, all from Massachusetts. Although the absence of the crossvein in all these specimens was a very striking character; I did not choose at that time, without further proof, to consider them as a different species. Since then I caught numerous specimens at the Trenton Falls, in September, 1860, all partaking of the same character, which removes all doubt as to their specific diversity. Some of these specimens, probably recently excluded, were very pale and altogether without spots.

Mass. (Mr. Scudder); Trenton Falls (nob.)

AMALOPIS Halid.

A. VERNALIS.—Fusco-cinerea, thorace vittis tribus fuscis, media cuneiformi, capillari; alæ maculis 5 vel 6 in margine anteriore; long. 0.3—0.4.

Head brownish-cinereous, front infuscated in the middle, palpi at the tip; antennæ 16-jointed, not much longer than the head; basal joint yellowish, flagellum brown, verticils very short. Præscutum yellowish-cinereous with three stripes; the intermediate one broad, cuneiform, with a pale line in the middle (capillary); lateral ones abbreviated anteriorly; scutum infuscated in the middle; scutellum, metathorax and pleuræ cinereous; the latter somewhat hoary; halteres pale yellowish; feet brownish, base of femora pale. Abdomen brown, posterior margin of the segments pale; ♀ ovipositor ferruginous. Wings somewhat infuscated with five brown spots along the anterior margin; the first at the mediastinal crossvein, the second at the origin of the petiole, the third, fourth and fifth at the tip of the mediastinal, subcostal and radial veins; a sixth spot is at the tip of the petiole; besides these spots, all the crossveins and tips of the longitudinal veins are more or less clouded; the male especially has some indistinct clouds on the apical portion of the wing, along the veins: petiolate areolet extant.

Washington, D. C., two specimens (♂ ♀) in April (nob.)

This species shares all the characters of *Amalopis*; the palpi, however, seem to be somewhat shorter than in the other species of this genus. The structure of the discoidal areolet is very peculiar; the obliquity of the second lower discal crossvein, common to all species of the genus, is carried so far here, that this crossvein assumes an altogether longitudinal direction, and thus ceases to be a crossvein, becoming a mere prolongation of the second externomedial vein. In consequence of this, the following changes take place in the neurulation of that part of the wing: the discal areolet is narrow, parallel, and *has but a single* 1861.]

lower crossvein; the third externomedial areolet is unusually long, its basis being on the same line with the bases of the discal and of the fourth externomedial areolets; the third externomedial vein, instead of issuing from the discal areolet, runs parallel to it and becomes a mere prolongation of the præbrachial vein. Other peculiarities of the neurulation are, that the *cubital vein forks* and not the radial one (at least such is the case in both of my specimens), that the stigmal crossvein is close at the tip of the subcostal vein, and that there is a stump of a vein near the origin of the petiole. The ♂ genital organs seem to be analogous to those of *Pedicia*. The spurs at the tip of the tibiæ of this species are very small, almost imperceptible.

A. HYPERBOREA.—Fusca, alis fusco maculatis, *area pobrachiali media venula transversali instructa*; long. 0.45.

Very like the preceding, but easily distinguished by the coloring of the wings, by the presence of a *supplementary crossvein* about the middle of the pobrachial area, and by the oblique direction of the second lower discal crossvein (similar in this respect to all the other species of *Amalopsis*).

The only specimen which I possess is spoiled by mould, so that my description will necessarily be incomplete.

Body brownish, antennæ brown, feet brownish, base of femora paler, tip of tarsi dark brown. Wings with a slight brownish yellow tinge, and with brown spots at the tips of nearly all the veins, as well as at their anastomoses. There are seven such spots along the anterior margin (one at the humeral crossvein, another a little beyond it, a third at the mediastinal crossvein, a large spot at the origin of the petiole, extending to the anterior margin, the following three at the tips of the mediastinal-subcostal and radial veins); similar, but smaller spots at the tips of the veins of the posterior margin (beginning with the first externomedial); other spots at the base of the pobrachial area, in the middle of the subaxillary area (at the posterior margin), at the basis of the petiolate areolet, of the area formed by the fork of the cubital vein, and a square cloud in the middle of that area; crossveins also clouded.

The petiolate areolet is present; the stigmal crossvein is near the tip of the subcostal vein, and there is a stump of a vein near the origin of the petiole. Labrador; single ♂ specimen.

Contributions to the Ophiology of Lower California, Mexico and Central America.

BY E. D. COPE.

VIPERIDÆ.

Caudisona durissa Laur. Cope, Smithsonian Contributions, v. xii. Researches on the venom of the Rattlesnake, by S. W. Mitchell, M. D., p. 120.

A male specimen of this serpent (No. 4945) has been sent by Capt. J. M. Dow, from La Union, San Salvador, to the Smithsonian Institution (No. 4945). It is identical with specimens from Surinam in Mus. Academy, exhibiting similar muzzle plates, head and neck stripes, and the isolated black dorsal rhombs upon a yellow ground, with yellow centres. The crepitacula of this species and the *C. terrifica* are much shorter and more compressed than in *C. atrox* and *C. horrida*.

Caudisona atrox sonoraensis Kenn. Proc. Acad. Nat. Sci. Phila. 1861, p.

Specimens sent from Cape St. Lucas, Lower California, to the Smithsonian Inst. and Phila. Academy, by Mr. John Xantus, are more delicately tinted than Sonora specimens. The dorsal rhombs are more perfect, their yellow borders brighter, and their centres paler and similar in color to the lateral interspaces. The scales but little roughened.

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Caudisona enyo Cope.

Head depressed, covered with small keeled scales. Superciliaries large, prominent, preceded by a small marginal plate; muzzle covered above with nearly equal polygonal scales, slightly or not keeled. Rostral plate low, in form a nearly equilateral triangle: nasals two, the anterior in contact with the rostral: numerous small scales anterior to the fovea lachrymalis. Thirteen or fourteen superior labials, the posterior small; fourteen and fifteen inferior, the second, third and fourth in contact with the genaeal. Two rows of smooth scales, and the infra orbital circle, separate the labials from the orbit; the scales of the former continue smooth upon the temporal region, and are larger than the labials. Scales of the body rounded, short upon the sides, especially those of the first three rows which, near the middle of the body, are not at all, or scarcely, keeled. Total number of rows 23, the median very strongly keeled, none rugose striate as in *atrox*. Crepitaculum moderate, its segments diminishing in breadth towards its extremity. Gastrosteges 166. Urosteges 23 single, 3 pair double. Total length (including crepitaculum) 29 in. 9 lin. Tail 4 in. 3 lin.

General color above, light greyish brown, shaded with yellow; vertex rufous, marked with a pair of small brown spots. A light band, bordered with dark crosses each superciliary plate; from the inner border of the same plate commences a chestnut brown band, which diverges from its fellow on the posterior part of the head, where it is either interrupted or continuous with a broader one which nearly joins that of the opposite side on the neck: here they are either interrupted, or continuing, unite on the neck, and form the first spot. A brown band extends from the eye to the canthus oris, involving the last labial plate, and is continued beyond, forming a spot on each side the throat. A series of about thirty-three spots ornaments the middle line of the back; posteriorly they are of a wood brown color; the others chestnut brown bordered with black. Anteriorly the spots are longer than broad, emarginate anteriorly and posteriorly; opposite to each is a black spot upon scales of the first, second, and third rows. The dorsal spots become broader, resembling transverse rhombs, with light borders outside the black; the lateral angles become confluent with the lateral black spots, forming vertical black bands on the sides. They finally assume the form of transverse brown bands. The tail is crossed by five of these, upon a brown ground. Beneath yellow; tips of many of the gastrosteges blackish. Inhabits Lower California, whence specimens have been sent to the Philada. Academy and Smithsonian Institute, by Mr. John Xantus. Type 4663. Xant. Coll.

This species bears considerable resemblance to *C. molossus* in its style of coloration, and like it, is a beautiful animal. The latter species is scutellated upon the muzzle, as in *C. durissa*: the rows of scales are more numerous than in the *enyo*, and it is without the head stripes.

Caudisona mitchellii, Cope.

Head depressed, covered with small irregular scales, posteriorly keeled, anteriorly, and upon the obtuse muzzle, rugged, free at the lateral or hinder edges. Superciliaries prominent, striate rugose. One loreal; nostril large, prenasal small, higher than long, separated from the rostral and superior labials by small scales. Rostral low, an equilateral triangle. Sixteen superior labials, the last large, three rows between them and the orbit; temporals, large, smooth. Superior labials sixteen. Scales elongate, striate rugose, in 25 rows, all strongly keeled except the first. Crepitaculum well developed of the *C. atrox* type, i. e. strongly compressed, having the terminal complete segments as broad as the basal. Gastrosteges 198; urosteges 26. Total length (excl. crepitaculum) 44 in., tail 3 in. 6 l.

The color above and below is greyish yellow. The upper surface of the head is shaded, that of the body coarsely and densely punctulated with brown.

1861.]

The regular aggregation and deepness of these punctulations, form a series of about forty-two dorsal spots. These are transverse, with produced lateral angles, extending across twelve rows of scales from angle to angle, separated from the adjacent ones by a bright band of ground color one and a half scales wide. On the posterior fourth of the total length, they form brown cross bands: five upon the tail are black on a very light ground as in *C. atrox*. Anteriorly there is an ill-defined series of spots which are opposite those of the dorsal line. A yellow band extends from the nasal plates anterior to the eye, involving from the ninth to the last superior labial. Superior to this is a brown band extending from the eye and ceasing on a line with the angle of the mouth. Some indistinct brown marks on the top of the head are arranged as follows: one on the inner border of each superciliary; three posterior to these, the median short and broad; four further posterior, the median pair longer, diverging, reaching the neck. Cape St. Lucas, Lower California; one specimen (5291½ Sm. No.) in Mus. Smithsonian from Mr. John Xantus.

This curious rattlesnake is related to *C. tigris*, *C. cerastes*, and *C. lucifer*. In common with the first two and *C. enyo*, *lepidus* and *molossus*, it exhibits a low rostral plate. The plates of the superior parts of the muzzle resemble only those of (among the above mentioned species) *cerastes* and *enyo*, being small, irregular and rough, without even the marginal series seen in *lucifer*, *atrox*, *horrida*, etc. In shade of coloration it is not unlike *tigris*, being well adapted for concealment upon the sandy soil of the Californian deserts: the distribution and form of the spots are like those of *lucifer*. The separation of the prenasal from the rostral plate is peculiar to the species. It is named in honor of Dr. S. W. Mitchell, the author of the interesting "Researches upon the Venom of the Rattlesnake."

In the catalogue of rattlesnakes in the Smithsonian contributions, previously cited, thirteen species of the genus *Caudisona* were referred to, as distinguishably described. Two have been since added to this list, making, with those of the present memoir, the whole number seventeen. Of these, three inhabit South America, six Mexico, two Lower California, and eleven the United States. Two of the eleven are found east of the Mississippi River; one west of the Rocky Mountains; the intermediate region is inhabited by ten species,—*lucifer* entering from the west, and *horrida* from the east. Of these, the most northern, and widely diffused is *Lecontei*; it extends from southern Nebraska to Utah; in the great basin of the latter country a curious variety of it is found. *C. atrox* alone inhabits the greater part of Texas; in the extreme west of that State, and probably in Chihuahua, *C. lepidus* occurs. The greatest intensity of species is in south western New Mexico and Apacheria (or Arizona), where are found *tigris*, *cerastes*, *scutulatus*, *atrox sonoraensis*, *molossus*, and perhaps *lucifer*.

Structurally, the South American species and *molossus* form a group characterized by the six regular plates of the muzzle, and the small rattle. The single nasal and smooth head plates isolate the *lepidus*. The superciliary hornlike processes, and the rostral plate, broader than high, separate the *cerastes*. The remaining species form the largest group, where there are two nasals, one or more pairs of marginal plates between the superciliary and rostral, separated on the median line by smoother or rougher, small irregular scales; no superciliary processes. *C. mitchellii* must be distinguished from these by its absence of marginal plates, and presence of scales on the lateral borders of the rostral. All the species have Professor Reinhardt's scale pores in pairs; they are very difficult to observe in some of the species—as *cerastes* and *mitchellii*. In *durissa*, a single pore is frequently met with.

Bothriechis mexicanus Cope. *Atropos Mexicanus*, Dum. Bibr. vii. p. 1521. Specimens in Mus. Smithsonian and Academy from Dr. C. Sartorius from

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Mirador, Vera Cruz. As suggested in these Proceedings for 1859, p. 339, this species does not belong to the *Atropos* of Wagler.

There is a superciliary plate, much encroached upon by the scales of the vertex. The description in the *Erpetologie Generale* is applicable to our specimens, but the coloration of the plate is slightly incorrect. The dark brown dorsal rhombs are occasionally isolated.

Bothriechis brachystoma Cope. *Teleuraspis Castelnaui* et var. *brachystoma* Cope, Pr. A. N. S. 1859, p. 339. Ibid. 1860, p. 72.

This species is not *Bothrops Castelnaui* of the *Erpetologie Generale*, as we had been led to believe, through the insufficiency of the brief description in that work. An examination of Prof. Jan's synopsis in *Rev. et Mag. de Zool.* 1859, p. 155, shows it to be similar to the *B. numifer*, but as I have failed to find any description of the latter, I have retained the name given as above.

Scales of the vertex, front, and temporal regions, keeled. Canthus rostralis prominent, acute, bordered by three scales on each side. Muzzle recurved, rostral plate high. Superior labials normally ten, rarely nine or eight. Second separated by a plate from postnasal, and with the third by granulations from the fossette. Fourth and fifth largest, separated by one row of scales from subocular granulations. Twelve to fourteen inferior labials. Dorsal scales in twenty-five rows, all keeled but the first. Tail short, quite slender, terminated by a small corneous appendage, which is compressed, grooved upon each side, each moiety inflated, the inferior most produced. Total length 13 in. 9 lin., tail 1 in. 5 l.

Ground color above, gray or fulvous brown, lightest medially. On each side of the median line a series of from sixteen to twenty-one parallelogrammic brown spots, which are opposite or alternate with those of the opposite side, and frequently divide into double triangles anteriorly. Two spots on the third, fourth and fifth rows opposite each dorsal spot. Gastrosteges and throat clouded and punctulated with brown. Head above and jaws dark brown; a light band back of the eye. In the type of var. *brachystoma*, the superior labials are abnormally nine, the upper and lower labials and genaeal region brownish black; on the inferior labials three light spots, the two anterior continuous from the eye, the posterior prolonged on the neck, forming a light band. A specimen in the Mus. Smithsonian from La Union, Guatemala, from Capt. Jno. M. Dow, is similar to the last, except in having ten labials, four scales bordering the canthus rostralis on each side, twenty-eight pairs of spots, and gastrosteges broadly bordered with brown. Sm. No. 4950.

Bothrops atrox Wagler.

Specimens in Mus. Smithsonian from Greytown, Central America, Dr. Caldwell, donor, and from Mirador, Vera Cruz, from Dr. C. Sartorius. The latter is the most northern locality yet recorded for this widely distributed species. The specimen is half grown, of a mouse color, with about twenty-one pairs of brown triangular spots, sometimes alternate, sometimes confluent on the median line. Sides of the head and throat yellow. Scale-pores not discoverable.

NAJIDÆ.

Elaps elegans Jan.

A beautiful specimen of this species from Mirador, Dr. Sartorius' Coll., in Mus. Smithsonian, exactly as figured and described by Prof. Jan. Some naturalists appear recently to have become convinced of the specific identity of the forms of *Elaps* from *corallinus* to *fulvus*. We are of opinion that a similar relation will be found to exist between *corallinus* and *lemon* 1861.]

niscatus, through *isozonus*, et. al., and that a belief in the identity of the *lemniscatus* with the *fulvus* will be equally "inevitable." In the case of the forms of the genus *Thamnophis*, a similar conclusion has been reached, though not consistently carried out, on account of a misapprehension relative to the structure of the preanal plate of the *T. sauritus*. The admission of the identity of *T. sirtalis* with *T. haydeni*, renders the acceptance of *fairleyi* and *sauritus* as distinct from the former, impossible.

Similar methods of reasoning would necessitate the union of many of the species of *Simotes*, *Tropidonotus*, *Lampropeltis*, *Caudisoma*, and no doubt at some future day of those comprised in the sections of "protean" genera generally. But if we are to be taught by nature, we will not assume a knowledge of her system which we do not possess; and laying down as our premises what are scarcely yet our conclusions, form associations which a fresh accession of information must compel us to alter. Let us simply record what we find to exist, and while the grand plan becomes more and more evident, will await patiently the period, perhaps not far distant, when we shall fully comprehend the details of our branch of the great Cosmos, and be able to present it in its completeness to the contemplation of man.

Elaps euryxanthus Kenn., Proc. Acad. Nat. Sci. Phil. 1860, 337.—Mr. Kennicott has not given us the locality whence the specimens described by him were obtained. We believe that one of them was from the region of the Gila. A specimen of the same serpent has been sent to the Mus. Compar. Zoology, Cambridge, from Guaymas, Sonora.

COLUBRIDÆ.

Himantodes leucomelas Cope.

Slender, but less elongated than *H. cenchoa*. Head very distinct, elliptic. Rostral plate triangular, subinferior. Vertical, with nearly parallel lateral borders, which are longer than the anterior. Length of occipitals, greater than their breadth, and than the vertical; marginal temporals six. Nasals small; loreal higher than long; two preoculars, superior not in contact with vertical; two postoculars, bounded posteriorly by two temporals. Eight superior labials; eye resting upon the fourth and fifth. Superior labials ten, sixth largest. Seventeen rows of scales, those of the median dorsal broader than long. Length of tail contained three and a half times in the total length. Ground color above and below white tinged with ash. This is crossed above by twenty-nine black elliptic spots, which cover the tips of the gastrosteges on each side. About eighteen spots on the tail. Beneath, punctulated with black, forming posteriorly a median band. A pair of elongate black spots extend from the posterior half of the superciliary plates, across part of the vertical, and the whole length of the occipitals, to a short distance posterior to them. They are separated by a narrow band of ground color. There exists a black spot on the anterior part of the vertical, and a band of the same across the postfrontals.

From Mirador, Vera Cruz. Dr. C. Sartorius. Mus. Smithsonian.

Himantodes gemmistratus Cope. *Himantodes cenchoa* Cope, Proc. A. N. S. Phil., 1860, p. 264.

Similar in proportions to *H. cenchoa*. Head short, thick, temporal region swollen. Lateral borders of vertical plate slightly convergent, equal in length to the anterior. The special peculiarities which distinguish it from *cenchoa* are as follows. The scales of the median dorsal series are diamond-shaped, longer than broad, not transverse. But one temporal in contact with the postoculars. Sixth inferior labial largest, not the fifth. In coloration it is quite similar; the spots upon the body number about forty-two, but they are peculiar in being connected by a median dorsal vitta. The belly is punctulated laterally, and is without the median vitta of the *cenchoa*.

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The brown of the upper surface of the head is pale, and is varied by a few irregular darker spots. Total length 30 in., tail 9 in. One specimen in Mus. Acad. Nat. Sci. from Capt. Jno. Dow. Habitat San Salvador, Centr. America.

This is a plainly colored species, resembling the *cenchoa* more than the *leucomelas*. In a specimen which we regard as belonging to the former from Trinidad, sent by Mr. A. H. Rüse to the Mus. Smithsonian, the spots are large, forty-three in number on the body, bordered with darker. The lateral borders of vertical plate are very convergent, almost continuous with the latero-posterior. The fifth inferior labial is largest. The coloration of the vertex, as represented imperfectly by Seba, consists of a chevron-shaped brown band between the orbits, the angle directed posteriorly; a light Y-shaped figure enclosed by brown bands on the occiput and nape; a shade of brown upon the vertical plate. The punctulations of the belly are most dense medially, forming a band.

In the three species of Himantodes, the postabdominal plate is divided, and the dentition dipsadine. In the two species here described, the scale pores are single; in *H. cenchoa* I cannot discover them.

Trimorphodon lyrophanes Cope. *Lycodon lyrophanes* Cope, Proc. Acad. Nat. Sci. 1860, p. 343.

Upon the species described as above, as congeneric with the *Siphlophis scolopax*,* we now establish the genus *Trimorphodon*, diagnosing it as follows: Body elongate, compressed; head distinct, depressed. Posterior superior maxillary tooth separate, grooved; median teeth small; anterior elongate, spaced. Anterior mandibular longer than posterior. Pupil vertical. Nasal plates two, loreals two, pre- and postoculars two or more. Scales of the median dorsal line small. Anal and subcaudal scutella divided. Scale pores double.

In *Siphlophis* the anal plate is entire, there is one preocular, and one loreal plate. The median dorsal series of scales is larger. In *Dipsadomorphus* the anterior teeth are not stated to be longer, the loreal and preocular plates are single, the median dorsal row of scales is larger. The anal is entire, and, if it be a valid character, the scale pores are single.

The genus is nearly allied to *Tripanurgus* and *Siphlophis*. The physiognomy of the species is repulsive. The present species has only as yet been certainly ascertained to inhabit Lower California; the identity of specimens from Arizona I regard as not ascertained. Mus. Acad. Nat. Sci. and Smithsonian.

Trimorphodon biscutatus Cope. *Dipsas biscutata*, D. & B. vii. 1153. *Dipsadomorphus biscutatus*, Gthr. Cat. Colubr. Brit. Mus. 176.

This species has the scales in twenty-five rows (23 D. & B.) the preceding, twenty-one. Here the preocular is in contact with the vertical; in the former not. This has the head bands in chevrons, the *lyrophanes*, lyre-shaped; the dorsal spots are also much more emarginate anteriorly, laterally, and posteriorly. The *biscutatus* is much the larger animal of the two. One specimen (5569) in the Mus. Smithsonian was obtained near Realejo, Nicaragua, by Capt. J. M. Dow.

Tropidonotus dimidiatus Boie, Isis von Oken, 1827, p. 535. Specimens of this forgotten species have been obtained near Jalapa by Mr. Pease, and sent to the Mus. Academy. It is related to the *T. Grahamii* Gthr., but wants the dorsal bands, and those margining the abdomen. The plumbeous of the superior regions extends to the first row of scales, (third in *Grahamii*),

* As Fitzinger's *Neue Classification* antedates Boie's memoir in the *Isis von Oken*, a strict application of the law of priority requires that the *Lycodon unicolor* of the former work (*Boadon* D. & B.) should retain its name, while the *scolopax* receive that of *Siphlophis*, Fitz. 1843.

the scales themselves obtuse, (subemarginate in *Grahamii*), in nineteen rows. There are nine superior labials, eye over the fourth and fifth, (six or seven in *Grahamii*, eye over third and fourth), one or two preocular, and two or three postocular plates. The head is shorter and broader than in *Grahamii*, hence the loreal is higher than long, instead of longer than high. The external nares have a more vertical aspect, but resemble those of *Grahamii* and of *Tropidoclonium* sp. in being connected by suture with the labial border only. The prefrontal plates are frequently confluent as described by Boie. Inferior surface uniform yellow; no median caudal band. Size that of *T. leberis*.

Tropidonotus validus Cope, Pr. A. N. S. Phil. 1860, p. 342. *Regina valida* Kenn. l. c. 1860, p. 334. *Tropidonotus tephroleura* Cope, l. c. 1860, p. 341. The Californian and Durangoan specimens, assigned formerly to distinct species, differ in little more than in the less elongated head of the latter. A specimen from Utah in Mus. Smithsonian is quite intermediate in this respect, proving that they are not worthy of receiving distinct appellations in the system.

Tropidonotus celano Cope, Pr. Ac. Nat. Sci. Phil. 1860, p. 341.

Inhabits Cape St. Lucas, Lower California. This species and the preceding, the only members of the genus inhabiting the Pacific region of North America, have the number of rows of scales similar to that characterizing the European and Asiatic species, while our Eastern and Southern species of the *sipedon* type, are different in this respect. They agree in the absence of scale pores with the American species of the type of *leberis*, and the *stolatus* and *quincunciatus* types of Asia. According to Mr. Xantus they are most common in swampy meadows among long grass.

Tretanorhinus nigroluteus Cope. Dorsal scales in twenty-one rows, all keeled. Head slightly distinct, narrow. Rostral plate broader than high, separated from the prefrontals by the nasals: each of the latter is subtransverse, the nostril between. Postfrontals as long as vertical; anterior border of the latter equal to the lateral: occipitals elongate, each bounded by seven temporals. Two loreals, anterior smaller; two preoculars, the superior smaller, not in contact with the vertical; two postoculars, in contact with the temporal. Eight superior labials, eye resting on the fourth; inferior labials ten, the sixth elongate, the tenth very small. Two pairs of postabdominal scutella. Gastrosteges 136 (tail mutilated); length of body 15 in. 6 lin.

Color above black, tinged with plumbeous as far as the superior half of the second row of scales; below yellow, punctulated anteriorly, especially upon the inferior labials. Upon the anterior third of the body, the punctulations form a narrow band upon the extremities of the gastrosteges, separated from the dorsal black by a narrow yellow band. A few irregular spots on the urosteges.

One specimen (5568) presented to the Smithsonian Inst., by Dr. Caldwell, from Greytown, Nicaragua.

This species differs from the *T. variabilis* D. & B. in color, in the greater relative size of the postfrontals, and in the presence of carinae upon all the more elongate scales. In both the *Tretanorhini*, the scale-pores are absent. Cuba is the native country of the *T. variabilis*, whence it does not seem to have been often sent. Dr. Lobi has presented it to the Academy, and Prof. Poey to the Smithsonian Inst. It is an interesting species, as exhibiting the full development of the structure towards which we see a successive approach in *Tropidonotus rhombifer*,* *T. ustus*, *T. cyclo-*

* Since this species was first made known by Dr. Hallowell, it has been described as *Tropidonotus pogonias* and *Nerodia holbrookii*; it is also very possibly *T. cyclopius* of Günther. The mental tubercles do not constitute a specific peculiarity, but are most common on all old individuals: they occur on both species of *Tretanorhinus*, *T. rhombifer* inhabits the Mississippi valley as far north as Southern Illinois, where Mr. Kennicott has obtained it.

pium* and *T. anoscopus*;† i. e. the approximation of the external nares—and consequent restriction of the prefrontal plates—and the narrowing of the superciliary plates, to give that vertical position of nostrils and range of vision so characteristic of the most highly aquatic types of serpents. The union of the prefrontal plates as in *Dimades plicatilis* is but one step further. Between the latter species and *Trop. rhombifer*, the *Tretanorhinus* may be said to be exactly intermediate in respect to position of nares and eye, carination and number of scales, and coloration. Besides this passage from the *Tropidonotinae* to the *Homalopsinae*, there is some analogy or affinity between such species as *Tropidonotus dimidiatus* and *grahamii* and *Hypsirbina enhydris* of the Old World. A similar connection may be traced through *Atretium*‡ *schistosum*.

Thamnophis cyrtopsis Cope. *Eutaenia cyrtopsis* Kenn. Proc. A. N. S. Phil. 1860, p. 333.

Var. *cyclides* Cope.

A single specimen from Cape St. Lucas, Mr. Xantus' coll. (Smiths. No. 5023,) corresponds in most respects with Mr. Kennicott's description, but differs as follows: The first dorsal row of scales is smooth; there are no spots upon the extremities of the gastrosteges; the seventh upper labial shield is principally bordered with black on its posterior border; there are two rows of small alternating black spots posterior to the post-occipital pair, instead of a single row of large ones; on the anterior third of the body there are two rows of small alternating spots, the inferior in contact with the lateral stripe, covering one or two scales, the superior in contact with the vertebral, and soon disappearing. The inferior series is larger near the middle of the body, but is lost posteriorly. The skin is marked with the usual large spots, forming a zigzag series. The head is very broad posteriorly, the muzzle short, the frontal region very declive.

* This species has been sent from Florida by Mr. Würdemann to the Smithsonian Inst. Specimens obtained in Southern Illinois by Mr. Kennicott probably belong to the same.

† *Tropidonotus anoscopus* Cope. Scales small, in twenty-three rows, all keeled except those of the first, which are of small size. Scale pores in pairs. Dentition syncraterian. Head oval, muzzle short, obtuse, profile plane. Rostral plate twice as broad as high, its labial border much shorter than the nasal. Nasal plates but little separated anteriorly by the prefrontals, scarcely touching the postfrontals; nostrils subvertical. Loreal higher than long. Preocular narrow, not in contact with the vertical. Prefrontals very small, subtriangular; superciliaries narrow; vertical elongate with parallel lateral borders; occipitals rounded posteriorly, bounded by one large and six smaller temporals. Postoculars two, the inferior and half the superior in contact with one temporal, also a series of small scales which separate the orbit from the superior labial plates. The latter are nine in number, the seventh largest, fifth beneath the middle of orbit. Symphyseal very small, transverse, ten inferior labials; genials elongate. Gastrosteges 143, one divided anal, urosteges 73; total length 14 in., of tail 3 in. 6 lin. General color above, dark plumbeous brown, with blackish vertical bars, alternate upon each side, one, or one and a half scales wide, and three and a half or four scales apart. Beneath dirty brownish white, each scutum brown at the base. Head and jaws brown.

Habitat. Cuba. Mus. Acad. Nat. Sciences.

This is probably the *Tropidonotus cyclopion* with 23 rows of scales of the *Erpetologie Generale*. Compared with Floridan specimens, noted above as the true *cyclopium*, with 29 or 31 rows of scales, we observe the following peculiarities in the latter, which are not shared by the former. The rostral plate is as high as broad; the nasals largely in contact with the postfrontals; the loreal triangular, longer than high; the preocular divided; two large and one small temporal bounding each occipital; eight superior labials, twelve inferior. Seven superior labials are assigned to the *cyclopion* in the *Erpetologie Gen.* In *T. rhombifer*, the aspect of the nares and orbits is less vertical, the rostral plate is as high as broad, and the dorsal scales and labials are different in numbers and proportions from those of the *anoscopus*.

‡ *Atretium* Cope, *Tropidophis* Gray, 1849, not Bibron, 1843.

1861.]

Phimothyrus grahamae Cope, Pr. A. N. S. Phil. 1860, p. 566.

This species has been sent to the Smithsonian Institute from Lower California, Mr. J. Xantus' coll.

Phimothyrus bairdii Cope. *Salvadora Bairdii* Jan. Iconogr. des Rept. Ophid. 1 livr. pl. iii. fig. 2.

This species inhabits the region of Jalapa. A specimen in Mus. Acad. Nat. Sci. exhibits one loreal and two preoculars on each side.

Conopsis vittatus Peters, Monatsberichte Preuss. Acad. 1860, p. 521.

The genus *Conopsis* is allied to *Phimothyrus*, *Coniophanes* and *Tomodon*. From the first it is barely separable, differing only in the grooved posterior upper maxillary; the rostral plate is quite similar to that of *P. bairdii*. As in that genus and *Coniophanes*, there are no scale pores. From the last two it differs in the prominent rostral and convex frontal region; *Tomodon* is further distinguished by its single nasal. *T. lineatus* D. & B. Erp. Gen. vii. 936, is apparently congeneric with the *C. vittatus*, differing specifically in its elongate prefrontals, and punctate gastrosteges. Guatemala is the native country of the *Conopsis*. Mus. Smithsonian, Capt. John M. Dow's coll.

Spilotes pullatus Wagler.

The following observations are suggested by an examination of ten specimens belonging to the museums of Philadelphia and Washington.

Two distinct forms may be distinctly made out. In the one the scales are very large, in from 15 to 18 rows, strongly keeled except the first two. Superior labials in four specimens seven, in one eight; the last, two-thirds the height of the penultimate in three, equally high in two; the fifth very small, not reaching the postoculars in four, reaching them in one. The upper surface of the head usually black, the tail and posterior third of the body black and bandless, in all. Two specimens from Surinam (Mus. Acad.), one from Trinidad (Mus. Gill) and one from Venezuela (Mus. Smiths.) one loc. ign. The second possesses 18 or 19 rows of smaller, weakly keeled scales, those of the first four or five entirely smooth. Superior labials eight, the ultimate as high or higher than the penultimate, the fifth large, approaching or reaching the postocular. The superior surface of the head yellow, crossed by four more or less irregular black cross-bands; the posterior third of the body crossed by numerous narrow, chevron formed cross-bands of yellow; the tail annulated with the same. Three specimens in Mus. Smithsonian from Mirador, Dr. Sartorius' coll. one loc.? Mus. A. N. S.

The first is the "Veränderliche Natter" of Merrem's Beitrage, Heft. 2, pl. xii., and *Coluber plutonius* of Daudin. The *C. pullatus* of Linn., Mus. Ad. Fried., which is *Cerastes mexicanus* Laur. and *Col. variabilis* of Nieuwied, is represented by these authors and by Seba as annulated posteriorly and upon the tail, though apparently otherwise similar to the *plutonius*. The second or Mexican form we do not find figured or described. It may be called for the present by the sub-specific appellation of *aureundus*.

Pityophis vertebralis Dum. & Bibr. not Günther. *Pityophis haematois* Cope, Pr. Acad. Nat. Sci. Phil. 1860, p. 342.

The serpent described in the Erp. Generale, and by me, as above, must be identified with the *Col. vertebralis* of Blainville, notwithstanding the imperfect figures and description of the latter author, and the adverse opinion of Günther. The specimens included under this head in the British Mus. Catal. obviously belong to a different species. *P. vertebralis* inhabits only Lower California, so far as known.

Arizona lineaticollis Cope.

Head distinct, elongate. Rostral plate rounded in profile, much elevated, the posterior angle right, not reaching postfrontals. The latter three times the

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size of the prefrontals. Vertical longer than broad, the anterior border straight, as long as the occipitals. Five or six small temporals on each side. Nasal plates large; loreal longer than high. Preoculars one or two, postoculars three. Superior labials eight or nine, liable to irregular subdivision; fourth and fifth, or fourth, fifth and sixth entering the orbit. Twelve inferior labials, postgenials very small. Scales small, in twenty-seven rows, the median ten keeled. Tail very short.

General color of a specimen long preserved in spirits: above light brown, beneath paler. The head is without markings. On the anterior part of the body two black bands, two and two halves rows of scales apart, extend for four times the length of the head and terminate each in a narrow elliptic annulus. The latter are nearly confluent with the succeeding pair of annuli, which are very narrow. These increase in breadth posteriorly until near the middle of the body they become confluent on the median line, forming geminate open spots; near the tail they lose the geminate form. Their whole number is 36 pairs, separate or united. Alternating with these is a small series of annuli, which become elongate anteriorly, and finally become short black lines, parallel to, and three scales from, the median pair. A few spots on the extremities of the gastral steges on the posterior part of the abdomen. Total length, 30 in.; Tail, 3.9 lin.

Habitat. Mexico. Mus. Acad. Nat. Sciences.

The American genus *Arizona* now embraces six species; viz. *A. elegans*, *jani*, *pleurostictus*, *reticulatus*, *deppei*, and *lineaticollis*. Three of these have been described by Dum. et Bibr. as belonging to their genus *Elophis*, i. e. *Natrix Laurenti* (*Coleber* Gthr.), but that genus is characterized by a differently formed rostral plate, and double anal.

Drymobius aurigulus Cope.

Of the group *Masticophis* B. & G. Scales in seventeen rows as in *testaceus*, those of the median series very elongate. Crown and muzzle very plane, supercilium and canthus rostralis prominent; eye moderate, muzzle more elongate than in any other species of the genus. Rostral plate rounded, prominent, recurved above. Vertical elongate, posteriorly half as wide as each superciliary, not in contact with preocular. Occipitals elongate, posteriorly truncate. Nasals and loreals very long, the latter encroaching much on preocular. Three pre-, two postoculars. Superior labials eight, fourth and fifth entering orbit; the last equal in elevation and length to the penultimate. Inferior labials ten, fifth largest; postgenials longer than pregenials.

Color above brown—becoming nearly black anteriorly. Cephalic plates light brown shaded with yellow. A narrow yellow band passes round the muzzle from eye to eye. A spot on the temporal region, one on the postoculars, all the labials, the chin and anterior part of the abdomen bright golden; sides of the neck to the fifth row of scales ditto. On the second and third rows of scales of the latter region is a black band regularly interrupted at intervals of about seven scales. It finally becomes continuous, and with a band upon the first row almost excludes the ground color upon the posterior and middle parts of the body. Abdomen dirty yellowish.

Proportions probably similar to those of *D. taeniatus*; (specimen mutilated.)

Habitat. Cape St. Lucas, Lower California. Mr. Jus. Xantus' coll.

This curiously marked species most resembles the *D. ornatus* (*Masticophis ornatus* B. & G.) The number of rows of scales is greater; the scales themselves are narrower; the muzzle is more elongate—hence also the nasal and loreal plates; there is one more preocular, and the ultimate superior labial is larger. (Smiths. No. 5793.)

Lampropeltis boylii, var. *conjuncta* Cope.

It was observed in these Proceedings, 1860, p. 255, that Cape St. Lucas specimen 1861.]

mens had the scales in the white cross bands black bordered. In specimens from Fort Yuma, the black so prevails as reduce the bands to series of light dots. Thus this variety is allied to the *L. splendida* in accordance with the general resemblance of Lower California reptiles to those of Arizona and Chihuahua.

The genus *Lampropeltis*, defined by Baird and Girard, and distinguished by me from *Coronella* *Laur.*, at p. 254 of these Proc. for 1860, is separated from the latter genus by a peculiarity not formerly observed. The scale pores are always double; in *Coronella* they are single, as correctly indicated by Prof. Reinhardt's table, p. 222, Vidensk. Meddel. Naturhist. Kjöbenh. 1860.

Lampropeltis polyzona Cope, l. c.
Mirador Vera Cruz, Dr. C. Sartorius.

Lampropeltis micropholis Cope, l. c.
A specimen in Mus. Smithsonian from Minatitlan Riv. Mexico, exhibits a few more pairs of rings than a Honduras specimen.

Hypsiglena ochrorhynchus Cope, l. c. 1860, 246.
Inhabits the southern part of Lower California. Bears some resemblance to the young of *Sibon annulatus*.

Hypsiglena torquata Cope. *Leptodeira torquata* Gthr., Ann. Mag. N. H. 1860 (March).

Inhabits Nicaragua and Laguna Id. A species nearly allied to the preceding, differing principally in having a transverse light collar upon the neck instead of three longitudinal blotches. A fourth species from the valley of the Rio Grande del Norte is known to me. The genus *Hypsiglena* can hardly be regarded as other than Coronelline in form, though so closely allied to *Sibon* among the Dipsadinae as to be scarcely separable from it. Regarding *Sibon annulatus* from Surinam as the true representative of that genus, the present form may be distinguished by the single scale-pores, the ungrooved maxillary teeth, the absence of tendency to irregular subdivision of lateral head-plates, and perhaps by the presence of the two preoculars. The species all seem to be of small size.

Chersodromus liebmanni Reinhardt, Vidensk. Meddel. Naturhist. Kjöbenhavn. 1860, p. 35, Taf. iv. figs. 10, 11.

This curious serpent, so nearly allied to the *Ninias*, particularly to *N. diademata*, has been sent from Mirador, Vera Cruz, in Dr. Sartorius' valuable collection. The union of the postfrontal plates occurs only in the following genera of serpents, so far as I am aware: *Temnorhynchus* *Sm.* and *Prosymna* *Gray*, in Africa. *Hydromorphus* *Pet.* Central America: *Chersodromus* *Rhdt.* Mexico, and a genus allied to *Elapomorphus*, from Paraguay.

Chilomeniscus stramineus Cope, Pr. A. N. S. Phil. 1860, p. 339.
Inhabits the southern part of Lower California. Specimens in Mus. Smithsonian and Academy, from Mr. J. Xantus.

This genus, with *Toluca*, *Stenorhina*, *Chionactis* and *Sonora*, and perhaps *Conopsis*, forms a little group, characterized by a very prominent transverse and slightly decurved rostral plate.

The form graduates into the ordinary Calamarian type. The first mentioned five genera may be thus distinguished:

I. Prefrontal and nasal plates confluent.*	
Dentition glyphodont; scales usually poreless,	<i>Stenorhina</i> .
Dentition isodont; scales uniporous,	<i>Chilomeniscus</i> .

* To this group belongs *Calamaria degenhardtii*, Berth. Abhandl. Goettingen, 1847, p. 8.
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II. Prefrontal and nasal plates distinct; dentition isodont.

a. Loreal absent.

Scales uniporous; vertical produced anteriorly; one nasal, Toluca.

b. Loreal present.

One nasal, two postoculars; rostral much depressed, Chionactis.

Two nasals, three postoculars: rostral little depressed, Sonora.

Gyalopium and Amblymetopon form another group, characterized by a stout form, distinct head, and recurved rostral shield; size small.

Chilomeniscus cinctus Cope.

Rostral plate projecting far backward, entirely separating the prefrontals, encroaching upon the postfrontals; the latter are in contact with the labials. Nostril connected by suture with the fronto-nasal suture. One very small preocular, two postoculars. Seven superior labials, the first longitudinal, the remainder vertical except the last two, which are nearly equilateral. Symphyseal in contact with genials. Scales broad, very smooth, in thirteen rows. Tail very short. Gastrosteges 11, one divided anal; urosteges 21 pair. Total length seven inches, tail eight lines. Ground color white, with a reddish tinge, encircled by sixteen black rings upon the body, and three upon the tail. There are four or five scales in width, and separated by equal spaces; they are narrower on the belly. The head is black from the extremities of the occipital plates to the anterior part of the vertical, and to the second labial plate. Chin shaded with black.

Habitat.—Near Guaymas, east coast Gulf of California. Mus. Compar. Zoology Cambridge, No. 24.

The coloration is that of the species of *Chionactis*.

Stenorhina lactea Cope.

Similar in most respects to *S. ventralis*. Tail one-seventh of the total length. Scales in seventeen rows. Occipital shields longer than in *S. ventralis*, their common suture much longer than their supercilio-ocular. Vertical more elongate, with shorter latero-posterior borders. Frontals broader, (longitudinally); rostral plate more prominent. Postnasal in contact with preocular by a very short suture. Seven superior labials, broader than in *S. ventralis*. Six inferior labials, the first homologically equal the first and second. Preanal shield divided.

Total length 25 inches 5 lines; tail 3 inches 7 lines.

Color above brownish white; beneath paler. An indistinct band passes through the temple and eye to the muzzle.

Habitat.—Guatemala. Specimen 4944. from La Union, Capt. Jno. M. Dow's coll.

Stenorhina ventralis Dum., Bibr., Cope, Pr. A. N. S. 1860, 242.

A common serpent near Mirador, Vera Cruz, as proven by Dr. Sartorius. In this species the scales are uniformly poreless; in *S. lactea* a single pore is rarely seen; in *kennicottiana* (l. c. 242) a regular pair of pores, one odd, or one median pore, are sometimes observable.

Boa eques Eyd. et Souly.

Capt. J. M. Dow has sent this species from Guatemala to the Academy; another specimen in the same collection is said to have come from Caraccas. Greytown, Nicaragua, is a locality whence it has been sent to the Smithsonian Institution.

The scales of the orbital ring do not always rest upon the superior labials. The species is, however, easily recognized by its stout form, approximate spots, short, elevated muzzle, and general dark color. The rostral plate is always more constricted at the base than in *B. constrictor*, the labials less numerous and more elevated.

Loxocemus bicolor Cope, Pr. Ac. Nat. Sci. Phila. 1861, p. 76.

This genus, discovered in Guatemala by Capt. Dow, seems to confirm by its structure the propriety of the arrangements of Müller and Duméril, in which the Peropoda or Aprotrodonta is regarded as an equivalent of the other subordinate divisions of the Colubridæ or non-venomous Eurystomata.

According to Prof. Reinhardt, nearly all the genera of Boiæ have uniporous scales; in *Loxocemus* they are poreless, as in the Calamarinæ. Other resemblances to these serpents have been previously pointed out, loc. sup. cit. The os postfrontale is elongate falciform, articulated at its proximal extremity with an anterior prolongation of the os parietale, and slightly with an os supraorbitale. Between the latter bone and the os frontale a second superorbital is intercalated. The presence of these bones, together with the biserial urosteges, constitute points of affinity with the Pythons. The os mastoideum and o. quadratum are short and stout. The o. nasalia are slightly contracted by the production of the o. prefrontalia, but again expand, and unite with the o. frontale by an extensive suture. These two points are Erycine. The Boiæ seem, therefore, to be divisible into four subgroups—the Pythones, the Boæ, the Loxocemi and the Eryces. The osseous structures typical of these groups are: 1st, supraorbital bones and a dentigerous intermaxillary; 2d, no supraorbitals or intermaxillary teeth; prefrontals which separate the nasals from contact with the frontals, (observed in *Enygrus*, *Ungalia*, *Homalochilus*, *Boa*, *Chilabothrus*, *Eunectes*, *Epicrates*, *Xiphosoma*); 3d, supraorbitals present, intermaxillary edentulous, nasals articulating broadly with frontals, suspensoria short, stout; 4th, no supraorbitals or teeth on the intermaxillary; nasals articulating broadly with frontals, suspensoria short, stout.

Lichanura trivirgata Cope.

The genus *Lichanura* may be diagnosed as follows:

General form abbreviated and stout; tail short, thick, obtuse at the extremity. Head slightly distinct, elongate, subcompressed; muzzle rather constricted; eye small, pupil vertical. Rostral plate elevated; nostril between two plates, the anterior in contact with that of the opposite side, upon the median line. Posterior to these the upper surface of the head is covered with smooth scales. Labial plates without pits. Scales smooth, broad, poreless. Spurs conspicuous. Gastrosteges narrow. Fronto-nasal suture extensive.

This genus of Eryces differs from *Cusoria* Gray in its elevated rostral plate and its two nasal plates. In *Cusoria* there are three of the latter, and a depressed rostral. The form, etc., of the head is somewhat similar to that of *Homalochilus* among the true Boæ, which, however, possess a nostril bordered by three shields. *Acrantophis* Jan., the true position of which it would be interesting to know, appears to be an ally. The irregular squamation of the superior surface of the muzzle the acute tail, and partially divided urosteges of that genus, separate it.

L. trivirgata inhabits the southern region of Lower California, where Mr. J. Xantus has obtained it for the Smithsonian Institution (Nos. 2277 and 2287) and the Academy. He found it in swamps among the mountains. Its scales are in forty longitudinal rows, the inferior a little larger than the others. Ten scales in the ocular ring: superior labials fourteen or fifteen, the anterior three highest. Loreals, three superior vertical, two inferior horizontal. Rostral plate prominent, elevated, recurved, quinquelateral, its labial border as long as its nasal. Inferior labials fifteen, the anterior five longest. A short mental fissure. Total length 25 in., tail 4 in.

General color pale yellowish, tinged above with brown. The belly and flanks are irregularly specked with liver brown. Superiorly there extend from the muzzle to the end of the tail three deep liver brown bands, the median four, and the two lateral, five scales wide, separated by intervals three and a half scales in width.

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The coloration of this handsome Boa is altogether unique in the family. It calls to mind the *Phimothyræ* of the same region.

Charina plumbea Cope. *Wenona plumbea et isabella* Bd. et Grd., Catal. Serp. 1853, p. 139.

The Erycine genus *Charina*, established by Gray in 1849, has since, as it appears to me, received the names of *Wenona*, (Bd., Grd.,) *Rhoptrura*, (Peters. Monatsber. Preuss. Acad. 1858, p. 504), and *Calabaria* (Gray, P. Z. S. 1858, 155.)

The two latter authors have not, however, made us acquainted with the osseous structure of the African species upon which their genera are founded. In the American species the *os frontale posterius* is wanting, which constitutes an approximation to the *Tortricidæ*: the same peculiarity is possessed by *Lichanura*, though its external form does not betray the affinity thus expressed. In the typical subgroup of the *Eryces* this bone is present. The two species of Baird and Girard's *Wenona* are probably identical, as suspected by Dr. Cooper, in the Nat. History of Washington Territory. That the *C. plumbea* differs from *C. Bottæ* Gray, appears to us doubtful. The former occurs at Guaymas, Sonora. Mus. Comp. Zool. Cambridge.

TYPHLOPSIDÆ.

Stenostoma humile Cope. *Rena humilis* Baird et Girard Catal. Serp. Smiths. Inst., 1853, p. 143.

Specimens from Cape St. Lucas are identical with those from the parallel of Fort Yuma, east of the mountains. In both I have found the scales to be in fourteen longitudinal rows, not fifteen, as described.

Rena B. & G. has been stated by Prof. Peters (Monatsber. Berl. Ac. 1857, 402) to be identical with *Stenostoma Spix*, as is obviously the case. The second species found in the United States, *S. dulce*, inhabits Texas and Florida (*Kirtland coll.*) The scales of this also I find to be in fourteen rows.*

Of the sixteen species of serpents which Mr. Xantus has obtained near Cape St. Lucas, but eight are known to inhabit other regions. Of these, the *Lampropeltis* and *Stenostoma* have been found near the head of the Gulf of California. The *Trimorphodon* may have been found in Arizona. The *Phimothyræ* inhabits Chihuahua, Sonora and Arizona; the *Thamnophis*, Durango and Coahuila; *Tropidonotus validus*, Durango and Utah; while *Caudisona atrox* and *Drymobius testaceus* extend as far east as Texas and Arkansas.

Of the eight peculiar species, seven belong to genera which are represented by allied species in the above regions, *Lichanura* only not having been found elsewhere. This is evidence of the identity of the Cape fauna with the Sonoran and New Mexican, as pointed out by Prof. S. F. Baird, Proc. A. N. S. Phila. 1859, p. 299.

One species of the sixteen (*Lampropeltis boylii*) inhabits the State of California, but the Lucasian specimens have much the character of those of another species (*L. splendida*) found in Arizona. But five of the twelve genera are represented in the first mentioned region. The Californian genus *Charina* has been found at Guaymas, on the east coast of the Gulf of California, but not in Lower California.

While two of the species inhabit Texas, seven of the genera are represented there.† Those not represented are *Hypsiglena*, *Chilomeniscus*, *Lichanura*,

* Many of the species noticed in this enumeration have been obtained through, or exist only in, the museum of the Smithsonian Institution, Washington. The author desires to express his acknowledgements for the opportunities obtained under the liberal constitution of that institution as interpreted and executed by its Secretary, Prof. Joseph Henry, LL. D.

† Prof. Baird, Pr. A. N. S. Phil. 1859, p. 300, alludes to species allied to *Arizona elegans* and *Scotophis Emoryi* from the Cape. These I have not seen.

Trimorphodon and (?) Phimothyra. Elaps, extending westward to the Gulf of California, has not yet been discovered at the Cape.

No species has yet been found which is common to Cape St. Lucas and the country of Vera Cruz and Jalapa. The genera common to both are Caudisona, Drymobius, Thamnophis, Tropidonotus, Lampropeltis and Phimothyra; all found also in Texas and the Southern United States.* They form but one-half of the whole number included in the Lucasian fauna.

Genera characteristic of Jalapa, and not known to exist in Lower California, Arizona, or Texas, are Catostoma, Ninia, Chersodromus, Pliocercus,† Stenorrhina, Himantodes, Bothrops and Bothriechis; all of which, except Chersodromus, are represented in South America and intermediate localities. The latter statement is true as regards Sibon, Coniophanes, and Spilotes, which Jalapa shares with Texas, and of Arizona and Dryophis, which are found in Sonora. Omitting Thamnophis and Lampropeltis as common to the two faunæ, we find here but one nearctic type (Tropidonotus) among the many neotropical.

We know but little of the herpetology of Guatemala west of the Cordilleras. Caudisona duriss is the only serpent yet obtained there, which we suppose to be found in Vera Cruz. The ten known genera are identical, excepting Loxocemus, and Conophis. Other genera which have not been found north of Central America, are Colobognathus, Hydrodipsas, Hydromorphus, Thamnococheilus, Dipsas, Tomodon, Xenodon, Scolecophis, Oxyrhopus; the first four are not known to extend into South America. Trimorphodon, Hypsiglena and Tantilla, are the only genera known to be common to the fauna of Central America and that of Lower California, Sonora and Arizona, which may be called the Sonorian.

Comparing this last subfauna with that of Southern Texas, at least five degrees further south, we find that while neotropical genera are to nearctic in the former in an equal proportion, in the latter they are as one to four. Of five genera peculiar to the former region, four have neotropical representatives, none nearctic. No genus is peculiar to the Texan region. Rhinocichilus, common and peculiar to the two regions, is nearctic in relationship.

The probabilities are then, that the artificial line separating the neotropical and nearctic groups of faunæ must be placed several degrees further north on the west of the Cordilleras than on the eastern coast region. It is also probable that the tropic of cancer, the line proposed by Dr. Günther, will be found to be nearly the true position of its eastern extremity.

List of the Mollusca inhabiting the neighborhood of Philadelphia.

BY W. M. GABB.

Believing that the best way of obtaining an accurate knowledge of the geographical distribution of species, is by the publication of numerous local lists, I have prepared the following catalogue of Mollusca of our neighborhood. Most of the species have been collected by myself this season. I have received valuable information and assistance from several of my friends, all of which is acknowledged at the proper place. I have been careful to point out the principal localities, more especially to assist young collectors.

GASTEROPODA.

MELANIIDÆ.

Melania Virginica Say.—Found everywhere. The specimens from the Schuylkill appear to be somewhat larger than those from the Delaware.

* *Phimothyra grahamae* has been obtained at Port Mojave, California, by Dr Cooper, vid. Proc. Cal. Acad. Nat. Sci., 1861, p. 123.

† Is not this *Elapochrus* Peters? A species inhabits New Grenada, and a third (*P. aequalis* Salv.) eastern Guatemala.

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"Finest in the Wissahickon and Schuylkill, above the dam." (Tryon.) *M. multilineata* Say, and the other names, quoted as occurring in this neighborhood, are synonyms of the above.

RISSOIDÆ.

Leptoxis altilis Lea.—Very abundant at Gloucester; also found in the Schuylkill, and in the ditches along Broad street, near League Island.

Amnicola grana.—Fairmount, Wissahickon, near Chestnut Hill, rare in ditches, south Broad street, with preceding.

A. lapidaria (Say sp.)—Under logs in a moist meadow above Red Bank, N. J. This locality was first pointed out to me by my friend, Dr. G. H. Horn, who discovered this species with several others in abundance. On visiting the spot with him, we obtained in about an hour nearly 300 specimens of this, besides other rare shells. I have never seen this shell from any other locality, though Dr. Leidy informed me that he has occasionally seen single individuals.

The habitat of the animal is curious. Belonging to a genus, all the other species of which, as far as I know, are strictly inhabitants of the water, we found this species in a spot where it could not possibly reach water nearer than a hundred yards, and associated with *Helix*, *Succinea*, *Carychium*, *Vertigo*, &c.

A. limosa Say.—Wissahickon, near Chestnut Hill, and Delaware River, below Gloucester. "Schuylkill, above the dam." (Tryon.)

A. lustrica Say.—"Wissahickon, above Chestnut Hill, under stones." (Tryon.)

A. porata Say.—League Island, in ditches; Schuylkill River, at Fairmount; Wissahickon, near Chestnut Hill.

VIVIPARIDÆ.

Vivipara (Paludina) *decisa* Say.—Most numerous in the Schuylkill, and at the extremity of League Island. Prefers muddy bottoms. Extremely common at all the mill-dams on the Wissahickon. (Tryon.)

V. subcarinata (Say sp.)—Preponderates in the Delaware, especially on the gravelly bottoms of the New Jersey side. Found also in the Schuylkill, but not so common. Very good specimens occur in the Wissahickon. "Kaighn's Point, N. J., very fine specimens." (Tryon.)

VALVATIDÆ.

Valvata tricarinata (Say sp.)—Rare. Found occasionally in the Wissahickon, especially near Chestnut Hill, where it grows quite large. Delaware River, (*teste* Say.) As far as I am aware, the variety *sincera* has not been seen in this neighborhood. Mr. Tryon, one of the best collectors in the city, says he has never seen it here.

HELICIDÆ.

Succinea ovalis Gld. non Say.—Abundant in the meadow near Red Bank, mentioned above.

S. avara Say.—Near the Falls of Schuylkill; near Manayunk, on the west side of the Schuylkill; near Red Bank, N. J.; "near Germantown, estate of E. K. Tryon." (T.)

Achatina lubrica Müll.—Rare. "Isolated individuals west of the Schuylkill." (Leidy.)

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Vertigo modesta Gould.—Meadow near Red Bank, rare.

Helix albolabris Say.—“Damp, shady woods and old quarries. I have found them at twelve or fifteen feet elevation on the perpendicular walls of an old quarry, near Germantown.” (Tryon.)

H. alternata Say.—“New Jersey, above Cooper’s Point,” (Leidy,) and found by Dr. Horn and myself, at various points around the city, especially at “Robison’s Knoll,” near the mouth of the Wissahickon, and on the west side of the Schuylkill, in damp places, usually under stones.

H. appressa Say.—“One specimen found near Germantown, on the estate of E. K. Tryon.” (T.)

H. arborea Say.—Common in logs and stumps, under bark.

H. cellaria Müll.—This species is said by Say (under the name of *H. glaphyra*) to have been found in Philadelphia, but I am not aware that it has since been reported by any one else. See Binney, vol. 4, p. 114.

H. chersina Say.—Banks of Delaware, ten miles above Philadelphia, (Phillips teste Say.) “Near Germantown, rare.” (T.)

H. concava Say.—I have found two specimens of this species, both west of the Schuylkill, one below the Columbia Bridge, the other opposite Manayunk. Mr. Conrad tells me that it was once very common west of the city.

H. electrina Gould.—Meadow near Red Bank, abundant. “One of the most numerous species around Germantown.” (T.)

H. fallax Say.—Robison’s Knoll, near the mouth of the Wissahickon, abundant; also found common in the woods along the Schuylkill. “Around Germantown, abundant.” (T.)

H. hirsuta Say.—Robison’s Knoll and west of the Schuylkill. “One of our commonest species. I obtained 25 from a stump last season, and 50 more from the same stump this summer.” (T.)

H. labyrinthica Say.—East side of Schuylkill, near Falls of Schuylkill village. Common near Germantown. Mr. Tryon says that this species lives more exposed to the sun, and seems to need shade and moisture less than perhaps any others of our native species, resembling, in this respect, the European *Helices*.

H. ligera Say.—Abundant in the meadow near Red Bank, and found occasionally in the woods west of the Schuylkill.

H. lineata Say.—“Near Germantown.” (Tryon.)

H. monodon Racket.—Probably should be considered as identical with *hirsuta* “Germantown, one or two.” (Tryon.)

H. pulchella Müll.—Germantown (Tryon); gardens in Philadelphia (Leidy); found by myself under bark in the woods near the Falls of Schuylkill, and by Dr. Horn and myself near Red Bank.

H. suppressa Say.—Robison’s Knoll, mouth of Wissahickon. “Most common of the small species, Germantown,” &c. (Tryon.)

H. thyroidus Say.—“Germantown, plentiful on the estate of E. K. Tryon.” (T.)

LIMACIDÆ.

Tebennophorus Carolinensis Binn.—One specimen found by Dr. Horn and two by myself, north of the city. Exact locality forgotten.

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Limax agrestis Müll.—Common under stones and bark, sometimes in very exposed situations; also in dark woods.

L. campestris Binn.—Generally found with the above. I have found both these species everywhere.

ELLOBIIDÆ.

Carychium exiguum.—Meadow near Red Bank.

LIMNÆIDÆ.

Limnæa catascopium Say.—Abundant in the Delaware; also found in the Schuylkill; not uncommon in the Wissahickon.

L. columella Say.—Abundant in standing water, especially in the ditches on and near League Island; in a brick pond west of the Baltimore Railroad Depot, I found it swarming; some specimens from this locality were more than an inch long. I have observed it also in the ditches, and even gutters along the roads in New Jersey, near Camden. Also "abundant in ponds near Germantown." (T.)

L. decidiosa Say.—Everywhere. Germantown (Tryon), Wissahickon, Schuylkill, League Island, but most rarely found in the rougher waters of the Delaware. This, with the *L. columella*, appear to prefer still and even semi-stagnant water, while the other two species are rarely found but in the larger streams, and generally on a sandy or gravelly bottom. Mr. Tryon thinks this is the most common species of the genus in this neighborhood.

L. fragilis Say.—This shell, if it is at all distinct from *L. catascopium*, is always found in the same localities. I have collected it principally in the Delaware, below Gloucester. I cannot see where the line is to be drawn to separate this from the more elongated varieties of the other.

Physa heterostropha Say.—Occurs in almost every body of water about Philadelphia. It is the most abundant shell of our vicinity. I cannot find any data on which to recognize the species *P. ancillaria*. I have taken hundreds of the *Physas* of our waters, and tried to draw some line to separate the two species; the height of the spire, the width of the mouth, the shoulder of the body whorl, all take such an infinity of forms, that, although I acknowledge to not having examined the animals of the two typical forms, yet, from the data before me, I am satisfied that these two so-called species *cannot* be separated on any characters based on the shells.

Planorbis armigerus Say.—"Wissahickon, rare." (T.)

P. bicarinatus Say.—Found almost everywhere, especially in the Delaware. Very abundant in the Schuylkill and its tributaries.

P. deflectus Say.—Beach at Gloucester; ditches, South Broad St. near League Island.

P. exacutus.—Wissahickon, near Chestnut Hill and brick ponds west of the Baltimore depot.

P. lentus Say.—"Delaware, and Haines' Pond, 1½ miles from Germantown. Very rare." (T.)

P. parvus Say.—I have only found this species at Gloucester. "Ditches, South Broad St." (Tryon.)

P. trivolvus Say.—Common in the Delaware, more rare in the Schuylkill. "All the ponds around Germantown, but always rarer than *bicarinatus*." (T.)

Ancylus rivularis? Say.—On stones in the Schuylkill, above the dam. Rare in the Wissahickon. I am not quite positive about the identification of 1861.]

this species, after a comparison with the original of the figure in Haldeman's monograph. It corresponds more nearly with this species than any other however, and I have yielded to the opinion of Mr. Tryon, who thinks this to be the species.

CONCHIFERA.

CYRENIDÆ.

Sphærium sulcatum Lam. (*Cyclas similis* Say.)—Wissahickon; Delaware, opposite the city, and in the ditches of League Island, where the finest specimens are found. Also, more rarely, in the Schuylkill. "A very small species of *sphærium* is found in Tryon's pond." (Tryon.) See Hartman's Cat. Shells of Chester Co.

Pisidium abditum Say.—Generally found with *S. sulcatum*, but more rare.

UNIONIDÆ.

Unio cariosus Say.—Most abundant about Gloucester. "Very common at Bristol and Tacony, and in the canal through Smith's Island." (T.)

U. complanatus Lea.—Everywhere. The best specimens are found at the extremity of League Island, and in the still waters of the Schuylkill. On gravelly bottoms the beaks are often very much worn. I found one specimen at the lower end of Peter's Island, in the Schuylkill, with two lateral teeth in each valve. "Very fine specimens at Kaighn's Point." (Tryon.)

U. Fisherianus Lea.—I discovered one specimen of this shell in the Schuylkill above Girard Avenue bridge. This is the only occasion, I believe, on which it has been seen so far north.

U. heterodon Lea.—Rare. Schuylkill below the Fairmount dam, (Lea.) Mr. A. J. Schafhirt found it on one occasion above the dam. "Darby Creek." Lea.

U. nasutus Say.—Everywhere. The principal localities are Gloucester, the Schuylkill river above the dam at Fairmount, and the extremity of League Island. At the latter place the largest individuals are found, and those from Gloucester sometimes exhibit the colored rays. "Little Perkiomen Creek, with a dark brown epidermis and more ponderous than usual." (Tryon.)

U. ochraceus Say.—More abundant at Gloucester than elsewhere, but occasionally found in the Schuylkill and Wissahickon. "There is no place where this shell attains such perfect magnificence as at League Island." Tryon.

U. radiatus Lam.—Same as the preceding species. "Very good specimens at League Island." (Tryon.)

U. Tappanianus Lea.—Is an inhabitant of the Schuylkill River, and may possibly be found near the city.

Margaritana undulata Lea.—Comparatively common in the Schuylkill and Wissahickon. Occasionally met with in the Delaware. "Magnificent, though rare, in the head waters of Frankford Creek, on the North Pennsylvania Railroad." (T.)

M. rugosa Say.—"Same locality." (T.)

Anodonta fluviatilis Lea.—Fine specimens occur in a dam on Mill Creek, at a place called Mill Town, two miles above Frankford. Not common in the Wissahickon or Schuylkill, but abundant at the extremity of League Island in the ditch and in the river. Also abundant at Gloucester. "Robert's Pond, 22d Ward; Wingohocking Creek and Silver Lake, near Germantown, at the latter place specimens have been taken $4\frac{1}{2}$ inches wide." (T.)

A. implicata Say.—Gloucester, Newtown Creek and League Island.

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